

Spahn & Rose Lumber Co.

HANDY ANDY ON THE FARM



Containing Complete Instructions on
HOW TO BUILD A RADIO SET

Illustrated by 16 Drawings

A Collection of the Best Ideas That Have Been Presented in "HANDY ANDY'S DEPARTMENT" Which Appears Every Month in FARM MECHANICS MAGAZINE—One of the Radford Publications. • Wm. A. Radford, President. 1827 Prairie Avenue • Chicago • Illinois

"One Piece or a Carload"

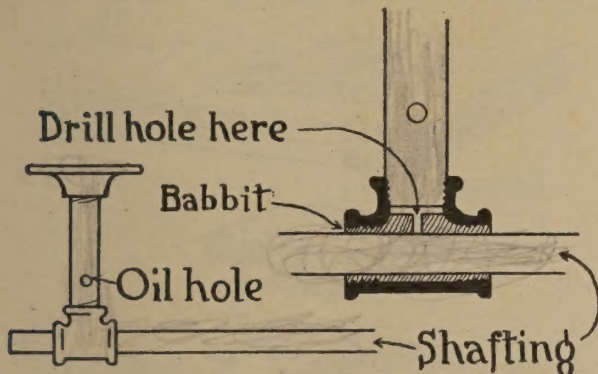
TABLE OF CONTENTS

	Page		Page
Handy Andy in the Farm Shop.....	1	Dry-mash Hopper.....	34
Shaft Hanger That Is Simple to Make	1	Protects Water Supply.....	35
Force Feed Drill.....	1	Catch Chickens With Hook.....	35
To Drill a Hole in Iron.....	2	A Good Trap Nest.....	35
Disappearing Bench Stop.....	2	Automatic Chicken Feeder.....	36
Vise Jaw Faces.....	2	Chicken Grit Feeder.....	38
Home-made Leather Punch.....	3	Poultry Fountain.....	37
Cup for Bit.....	3	Barrel Chicken Coop.....	37
Repairs Gravity Oiler.....	3	Sanitary Water Fountain.....	38
Preventing Shop Drawer Spills.....	4	Brood Coops for Hen and Chicks.....	38
Tool Bag.....	4	Water for Poultry Yards.....	39
Cage for Twine Ball.....	5	Hog Feed Trough.....	40
Mending Broken Strap.....	5	Corn Chopping Block.....	40
Mounting a Grindstone.....	5	Handy Andy in the Field.....	41
Self-adjusting Bench Clamp.....	6	Fence Wire Splicer.....	41
Sandpaper Block.....	6	Barbed Wire Reel.....	41
An Engine Protector.....	6	Wire Fence Fastening.....	42
Measuring Box for Concrete.....	7	Handy Method of Marking Posts.....	42
Use for Auto Tire Casing.....	7	For Pulling Fence Posts.....	42
House for Pump Engine.....	8	Binding Stick.....	43
Handy Andy in the Farm Home.....	9	To Anchor Fence Corner.....	43
Hinged Stool for Kitchen Table.....	9	A Salt Box.....	43
Combination Bread Cupboard and Cut-	9	Handy Band Cutter.....	44
ting Board	9	Useful for Cutting Bands.....	44
A Hinge Broom Holder.....	10	To Keep Plow Out of Ground.....	44
Table Adjustable in Height.....	10	A Good Salt Box.....	45
Oven for Oil Stove.....	11	Adjustable Plowing Measure.....	45
Ironing Board Cover.....	11	Eliminates Jolts of Roller.....	46
Back-saving Scrub Brush.....	11	One-man Crosscut Saw.....	46
Useful Pin Cushion.....	12	Making the Seat Ride Easy.....	47
Clothes Line Holder.....	12	Prevents Backaches.....	47
Shop or Home Desk.....	13	Corn Uncoverer.....	47
Rotating Foot Scraper.....	13	A Simple Scarecrow.....	48
Buckles for Overshoes.....	13	To Move Heavy Tile.....	48
Handy Andy File.....	14	Handy Andy in the Yard.....	49
To Tighten Clothes Lines.....	14	A Home-made Ladder.....	49
Novel Seed Corn Tester.....	15	Concrete Cistern Cover.....	49
Wool Tying Device.....	15	Handy Mail Box.....	49
Convenient Combination Ladder.....	16	Mail Box Signal.....	50
Seed Potato Cutter.....	16	Making Spring Flow Clear.....	50
Handy Andy in the Garage.....	17	The Both-way Gate.....	51
Rig for Oil Barrels.....	17	Pigeon Cote Weather Vane.....	51
Barrel Without Faucet.....	17	Improved Seed Flat.....	52
Tool for Changing Auto Tires.....	17	An Adjustable Gate.....	52
Tool for Fastening Tire Chains.....	18	A Simple Bird House.....	53
Piston Ring Compressor.....	18	Garden Row Coverer.....	53
To Mount a Tire on a Demountable Rim	19	To Tether Cow.....	53
Extension Oil Can.....	19	Support for Kettle.....	54
To Jack Up Auto in Storage.....	19	Saw Horse.....	54
After the Collision.....	20	Quick-acting Latch.....	55
Radiator Filler.....	21	Recovers Pump Cylinders.....	55
Re-using Dry Batteries.....	21	Two-way Gate Hook.....	56
Swinging Door Fastener.....	21	Gate that Lifts and Folds.....	56
Cinder Remover.....	22	Handy Andy About the Farm.....	57
Pull Out the Car.....	22	The "Slip".....	57
Holds Door Partially Open.....	23	Simple Corn Unloading Method.....	57
Automatic Stop for Engine Pump.....	23	Stocks for Cattle.....	58
Small Swinging Door.....	23	Catches and Holds Hogs.....	58
Brake for Sled.....	24	Easily Made Shoveling Stand.....	59
Grease Cup for Wagon.....	24	Easy Livestock Loading.....	59
Pipe Under Concrete.....	24	Lightens Killing Work.....	60
Handy Andy in the Barn.....	25	Wagon Box Unloader.....	60
Barn Floor Scraper.....	25	To Oil Cultivator Blades.....	61
Ladder to the Hay Carrier.....	25	End Gate Fastener.....	61
Place for the Milk Sheet.....	25	Brush Sled.....	61
To Hold Feed Pail.....	26	Double-blade Buck Saw.....	62
Liquid Manure Frame.....	26	To Rescue Mired Animals.....	62
Feed Box Easy to Dump.....	27	Gate Closing Device.....	63
Medicine Funnel for Stock.....	27	Hog House Door Covering.....	63
Self-Regulating Ventilator.....	27	Tongue for Buckle.....	64
To Keep Milking Machine Clean.....	28	Easy Springs for Wheelbarrow.....	64
Grain Bag Holder.....	28	How to Build a Radio Set.....	67
Handy Milk Stool for Strippers.....	29	Modern Farm Building Designs.....	87
Ventilating Barn Window.....	29	Two Car Garage.....	87
Hay Loft Tackle.....	30	California Bungalow.....	88
Swinging Door Holder.....	30	Dutch Colonial House.....	89
Wire Line Holder.....	31	Square Hip-roof House.....	90
Cement Hitching Weight.....	31	Home for the Work Stock.....	91
Saves the Horses.....	31	Dairy Barn for 20 Cows.....	92
Hoist or Derrick.....	32	Where the Corn Crop Is Safe.....	93
Hog Slop Storage Tank.....	32	House for the Implements.....	94
Handy Andy in the Chicken House.....	33	Saw-tooth Roof Hog House.....	95
Chicken Feed Silo.....	33	A Good Colony Poultry House.....	96
Electric Egg Tester.....	33		

Handy Andy in the Farm Shop

Shaft Hanger That Is Simple to Make

THE drawing shows a shaft hanger that is easy to make, as the materials may be secured from any plumbing



Shaft Hanger Made of Pipe and Fittings.

supply establishment. The materials needed are an inch or inch and a half flange, a $1\frac{1}{4}$ -inch flange union, two $1\frac{1}{4}$ -inch nipples, from 4 to 6 inches long, and two $1\frac{1}{4}$ -inch pipe ties. The shaft is put thru the ties, leaving space all around for babbitt metal, which, when poured, should not be allowed to get into the threads. Use fire clay to stop up the ends when pouring the babbitt. An oil hole should be bored about 1 inch

above the threads. This makes a good, sturdy shaft hanger.

* * *

A Force Feed Drill

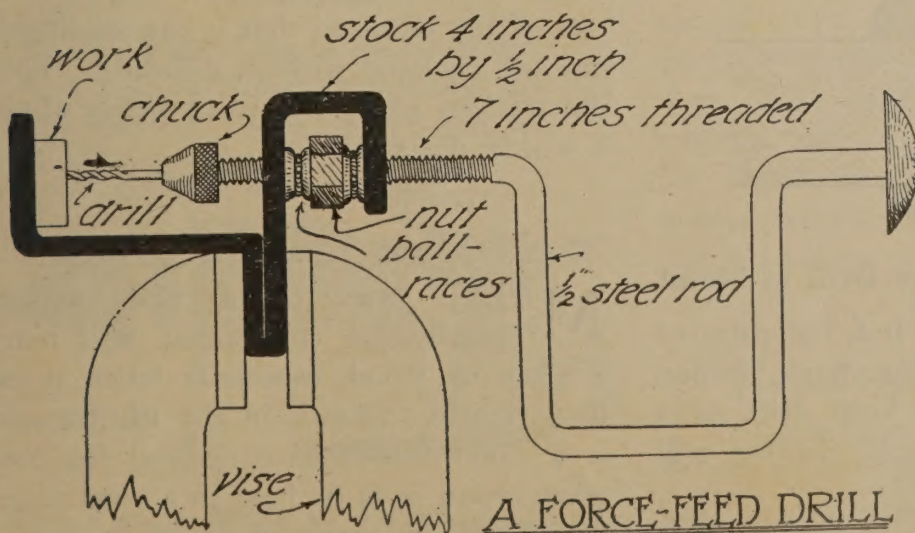
UNLESS one has a power or post drill on the place it is a tiresome job to do much drilling in iron and steel. The drills provided with the ordinary hand brace are effective enough when the proper means are at hand for doing the work right.

The accompanying illustration shows a simple, one-piece device which can be clamped in the vise. It will take material up to two or three inches in thickness and is provided with a special ratchet arrangement which makes it easy to apply all the lateral pressure necessary for the hardest metal. In other words, the only thing necessary is to turn the brace and now and then give the nut between the ball races a quarter or half turn, as the case may be.

A length of one-half by four-inch strap iron is procured. This is bent to the shape shown. Two holes are drilled thru the inverted "U" end, each five-eighths of an inch in diameter.

The brace consists of a length of one-half inch steel rod, also bent as shown. This is threaded for seven inches on the one end and the other provided with a hand-fitting piece of wood. The threaded end is cut down and again threaded for a small chuck, which need not assume any particular proportions.

The threaded end is then thrust thru



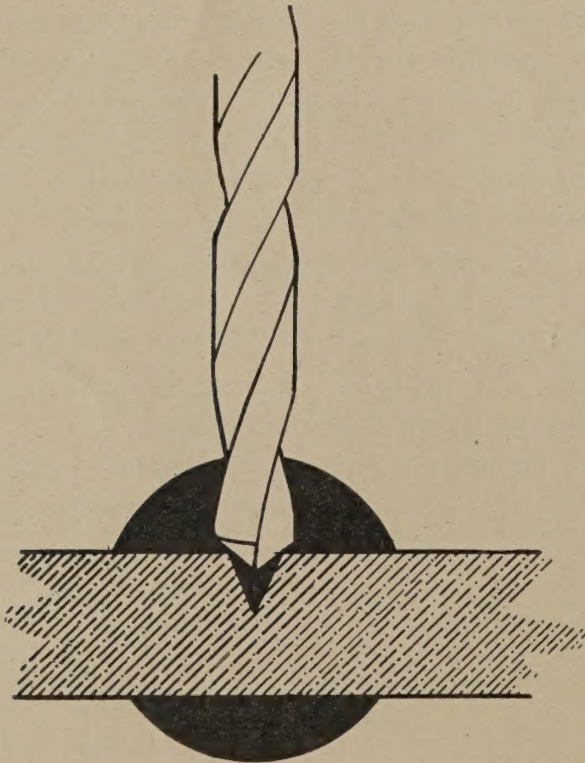
Plan Showing How to Make a Force-Feed Drill.

the first hole in the strap-iron stock, a ball race from an old bicycle thrust over it, a nut turned on, preferably a hexagonal nut, and then another ball race similar to the first. It will be seen by experimenting that the rod is forced along by turning this nut. The chuck is again turned on and after the device has been secured in the vise, is ready for work. The ball races prevent the nut from sticking to the sides of the strap iron and only when it is turned (with a small wrench in one hand) can the drill be fed further into the work. It will certainly pay for itself in short order.

* * *

To Drill a Hole in Iron

SUPPOSE you have to drill a hole by hand in some iron. To do it more easily, use a center punch that is sharper



V-Shaped Notch Starts Drill in Metal. pointed than the drill. It is the point of drill that makes drilling much harder. By centering often to keep drill away from the bottom of hole, drilling will prove less difficult.

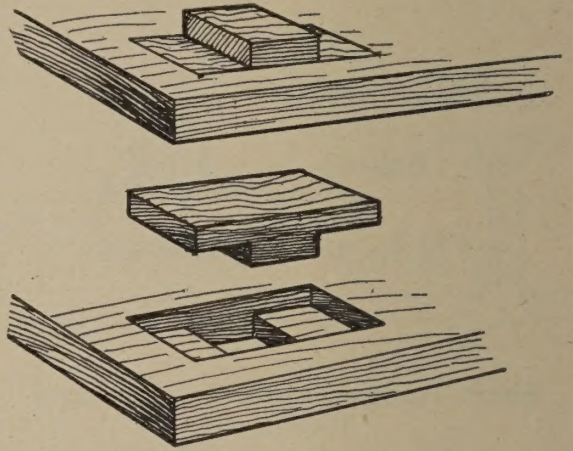
If a large hole is to be drilled, it is better to use a smaller drill first to make

way for the point of the larger drill. This is meant for drilling by hand, where you cannot use a machine.

* * *

Disappearing Bench Stop

A BENCH stop that is always at hand when needed, yet can be instantly removed when it would be in the way, is something desirable to every



Disappearing Bench Stop. Drawing Shows its Construction.

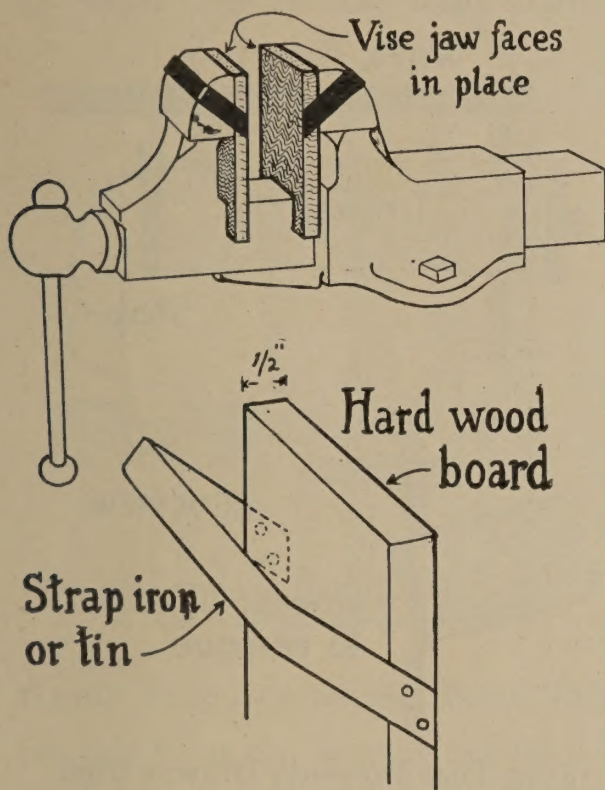
woodworker. Such an arrangement is shown here, and it consists of a block of wood 2 by 6 by 12 inches cut to the shape shown and made to fit a hole of similar shape cut in the bench top. When the block is fitted in the hole, the bench presents a smooth surface, but when the block is lifted out and reversed here is a neat stop an inch high and 6 inches in width. A thumb hole is bored at one end of the block so that it can be lifted out and changed without difficulty. The illustrations show the form better than a wordy description.

* * *

Vise Jaw Faces

METAL jaws of a vise, which usually are corrugated, will mar a piece of wood, especially when it is held tightly. Shown in the illustration is a wood face I have devised for use when wood is to be held in a steel vise. The faces are made of pieces of hardwood, the width of the vise jaws, and

notched to fit at the bottom. A strip of sheet iron or tin $\frac{5}{8}$ or $\frac{3}{4}$ of an inch wide is nailed to the boards, forming a loop



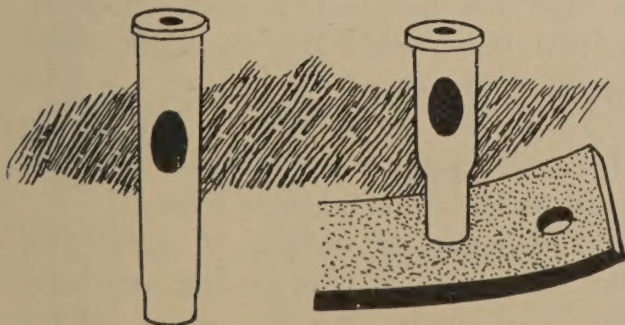
Vise Jaw Faces That Prevent Damage to Wood.

that fits over the jaws of the vise. With these faces in place any sort of wood may be clamped into the vise without damage.

* * *

A Home-Made Leather Punch

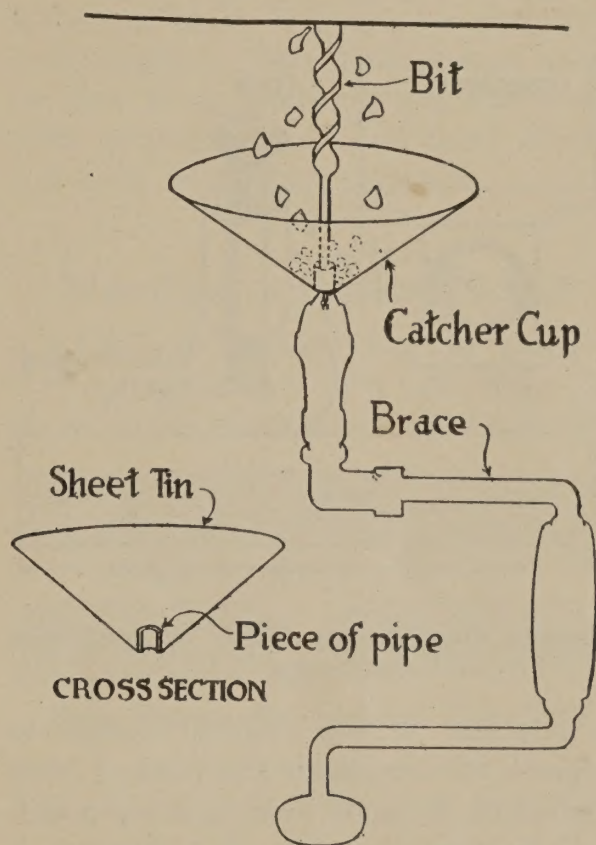
THIS punch can be easily made with a rifle cartridge shell, using the size shell desired. Holes cut to the side of



Belt Punch Made of Cartridge Shell. the shell enable you to empty the shell of leather without any trouble.

Cup for Bit

WHEN using a brace and bit to bore a hole in wood that is overhead, the borings that come from the hole often drop in the operator's eyes and divert his attention from the work.



Cup on Brace Catches Borings from Overhead.

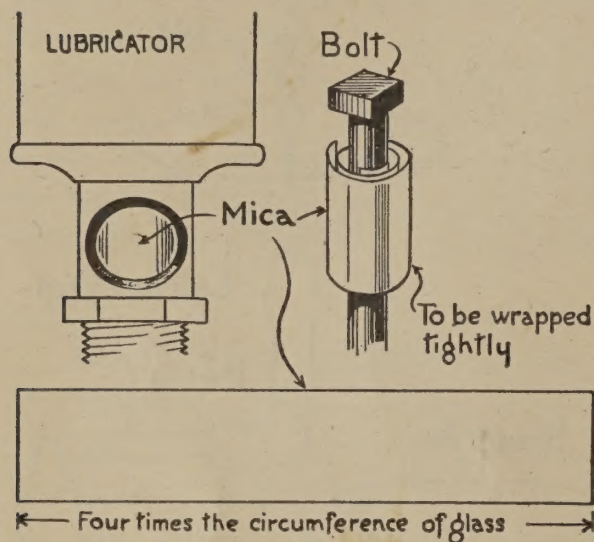
Shown in the accompanying illustration is a simple device that catches the borings as they fall. It is shaped like the top of a funnel and is made of sheet tin. Thru the mouth of the cup is a short piece of pipe thru which the bit extends and which gives it freedom, but holds the cup in place. The pipe is soldered in place, and may be of any size needed to accommodate the bit.

* * *

Repairs Gravity Oiler

I RECENTLY had occasion to repair and tighten up the gravity oiler on a large gasoline engine. The lower, or sight glass was missing and it was necessary to repair it immediately. I pro-

cured a sheet of mica such as is used in auto side curtains, and from it cut a strip as wide as the glass and as long as four times the circumference of it. I next wrapped the mica tightly around a bolt a little smaller than the inside diameter of the old glass and then placed it



Repairs for Gravity Oiler, when Glass Leaks.

in position. It was resilient enough to expand to the right size and I then shellacked the ends making it leakproof.

Care must be taken in tightening it up so as not to spring it and make it leak at the ends. I have found this to work better than the regular glass and is very cheap.

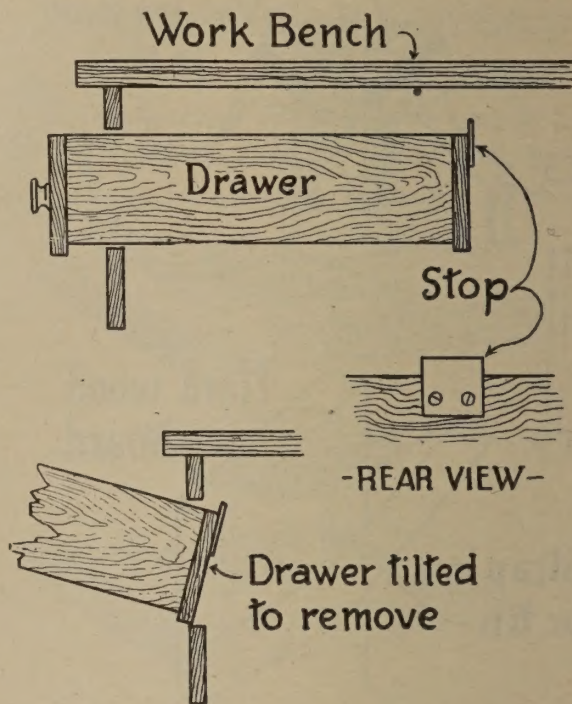
* * *

Preventing Shop Drawer Spills

HOW often when we are doing a hurry-up job the drawer of the farm work bench is pulled all the way out and it drops spilling its contents all over the floor. Then occurs perhaps a 15-minutes delay while we gather up the odds and ends of screws, bolts, nuts, metal scraps, or what-not that make up the average shop drawer's contents.

This trouble and delay can be avoided by a simple little device consisting of a piece of sheet metal about 3 inches

square, which is bolted or screwed to the back edge of the drawer as illustrated in the accompanying sketch. It projects about half an inch above the



Stop That Prevents Drawer from Pulling Out.

edge or sufficient to catch and hold the drawer should it be pulled out too far. Yet not too high in order to allow the drawer to be removed when desired by tilting it upward as illustrated. Of course, to put the plate on, the drawer must be removed.

* * *

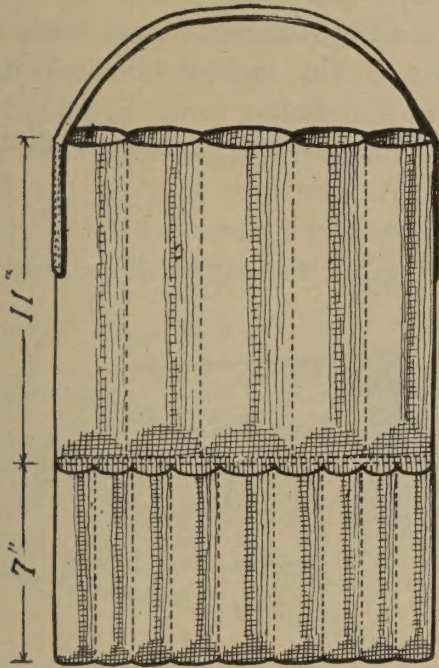
Tool Bag

WHEN a repair must be made on an implement in the field or on a fence, what is more aggravating than to find you have left a needed tool, or a tool that would do the work more easily, at the shop?

To prevent the annoyance, have a bag that will carry a complement of common tools for such repair jobs.

It is made by cutting 16 inches off the lower end of a grain bag and sewing horizontally thru the center of the piece, about 7 inches from the bottom. The pockets for tools are then made by sewing up and down. This makes two

rows of pockets of different sizes, in which the chisels, hammer, wrenches,



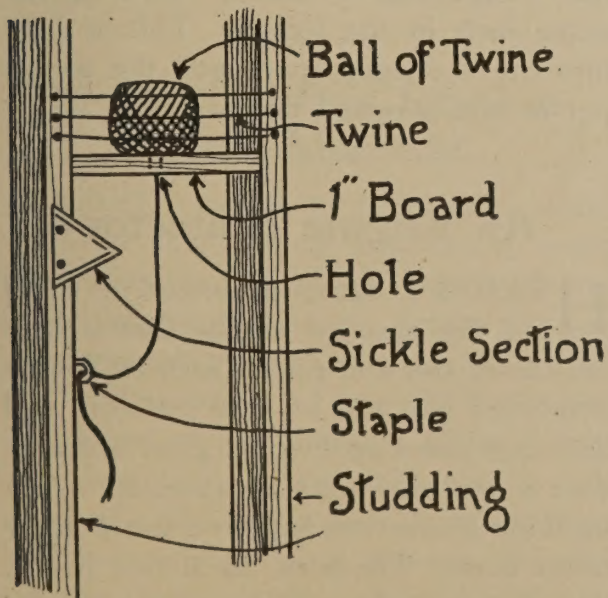
Handy Tool Bag for the Farm Shop.

bits, and so on, can be easily carried. A small rope or strap serves as a handle.

* * *

Cage for Twine Ball

MANY a time have I gone to get a piece of twine, only to find that it had been mislaid, or if I found it did not have a knife to cut it. To over-



Cage for the Twine Ball and Cutter.

come these annoyances I rigged up the

twine holder shown in the illustration. I took a 1-inch board and cut it to fit between the studding in my shop. A hole bored thru the board, allows the twine to pass thru, while the ball is held in place by strips on either side. The twine passes thru a staple in one stud, while just above is fastened a sharpened sickle section. This arrangement keeps the ball from becoming lost, the twine from getting tangled, and there always is a knife with which to cut it.

* * *

Mending a Broken Strap

HERE is an easy way to mend a broken strap. Cut the ends as shown in the illustration. Put these ends



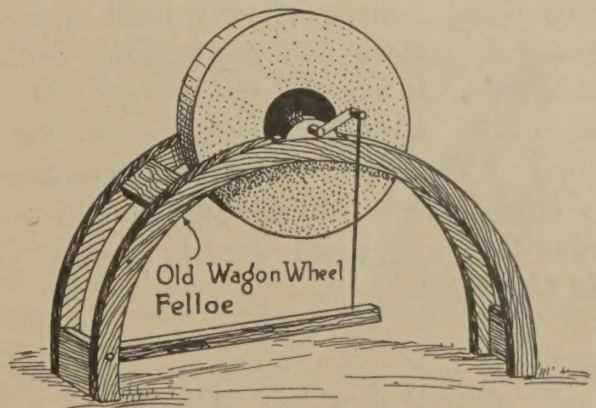
How Straps Are Spliced Together.

thru holes that have been cut in strap. After putting ends together, they can be riveted. But where rivets are not available, this is a good way to mend a broken strap.

* * *

Mounting a Grindstone

SAW a fellow of an old wagon wheel in two. To keep the two semi-



Mounting for Grindstone.

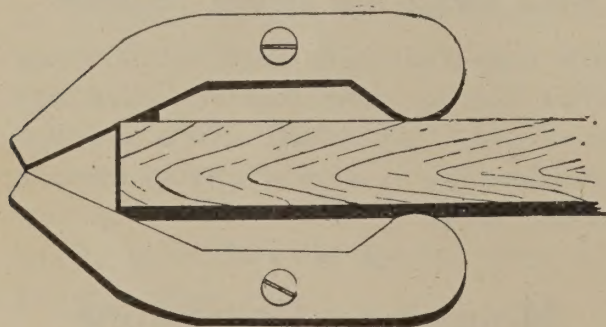
circles the right distance apart, I use

short pieces of one-inch boards nailed, so that the felloes are held together by the four of them. The metal mounting is from the old one. Screw it on the new stand. By doing this job it took me one hour, and I saved \$10.

* * *

Self-Adjusting Bench Clamp

A SELF-ADJUSTING bench clamp can be made by cutting dogs as shown in the accompanying diagram pivoting them by screws in the middle and placing them at a certain distance apart to take care of the average sized wood you happen to be working with. By thrusting a board against the lever end it presses the levers outward, causing the round grips at the opposite end to seize the board tightly by the inward pressure. If the clamps are made from metal it should be at least one-fourth of an inch thick to prevent marring the



A Self-adjusting Bench Clamp.

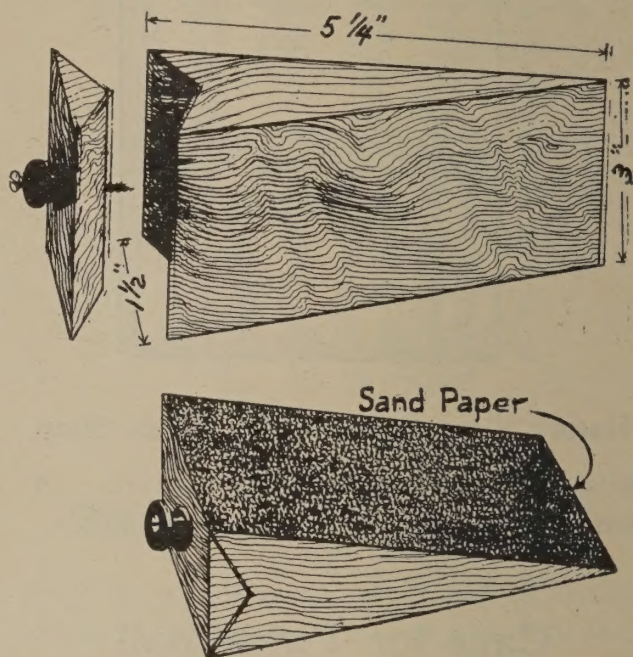
wood where the pressure is. If made from wood a piece of very hard wood should be chosen and much wider and thicker than if using metal, also cut with the grain running lengthwise to the clamp. To make one of a varied capacity (both narrow and wide) it should be made longer and with greater angles at the lever ends.

* * *

Sand Paper Block

IT is practically impossible to sand-paper in corners when the ordinary

oblong block is used. Here is a wedge-shaped sand paper block that will go into almost any place the user wants it to. The wedge-shaped block is made of hard wood, $1\frac{1}{2}$ inches thick, 3 inches wide and $5\frac{1}{4}$ inches long. The block is tapered to a point, as shown in the illustration. At the butt end of the block cut a V-shaped hollow. Fit the second block of wood the right shape into this



Wedge-Shaped Sand Paper Block.

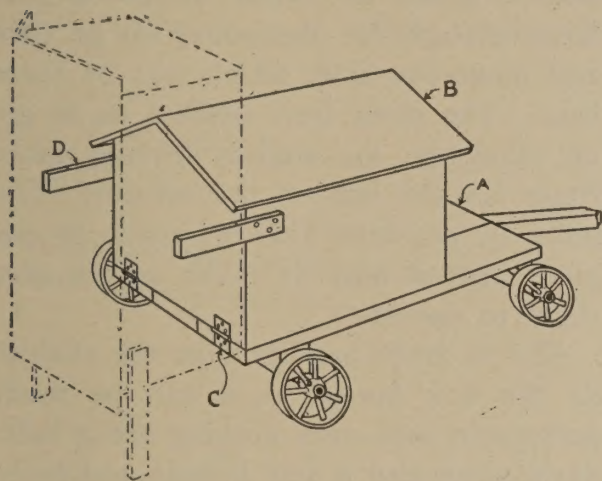
hollow and put a knob with a long screw thru it. The sand paper is cut to fit the wedge-shaped block, allowing an extra inch in the length. This is bent into the V-shaped space and the wedge put in and screwed down.

* * *

An Engine Protector

HERE is a dandy protector or cover for the gasoline engine that is kept outside in sun and rain. Such an engine gets rusty and full of sand and dirt, and does not stand up in such good order as does a machine that is protected. Any machine protection pays for itself many times over. The idea, as shown in the drawing, is to have the engine mounted on a truck. The sketched truck was made from the wheels of two small culti-

vators, and it has a plank platform (a), which slopes frontward a little to shed the rain. The engine is bolted to the platform where it is covered by a wooden hood when not in use. The hood (b) is fastened to the platform with two hinges (c), so that when the engine is



Tilting Cover for Gas Engine Mounted on a Truck.

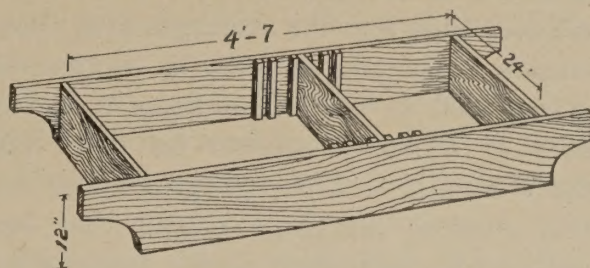
to be used, the hood can simply be raised backwards by pressing down the handles (d). The handles, when resting on the ground, also serve to hold the hood in its raised position. The hood was made water tight with a coat of thick paint. The roof can be covered with tar paper or shingles. Thus protected, the engine will stand as well outside the shed as inside.

* * *

Measuring Box for Concrete Material

MORE convenient and more accurate than merely counting so many shovelfuls or so many barrow loads, is a measuring box. A frame or box for measuring sand and gravel is shown in the illustration. For a 1:3:5 mixture the frame should measure inside 4 feet 7 inches long, 2 feet wide and a foot deep. On the inside and 33 inches from one end, a partition is placed. To use, set the frame on the mixing board and fill with crushed rock or gravel. Lift it up and set to one side, leaving the

gravel on the board. Fill the largest division with sand and again lift up the



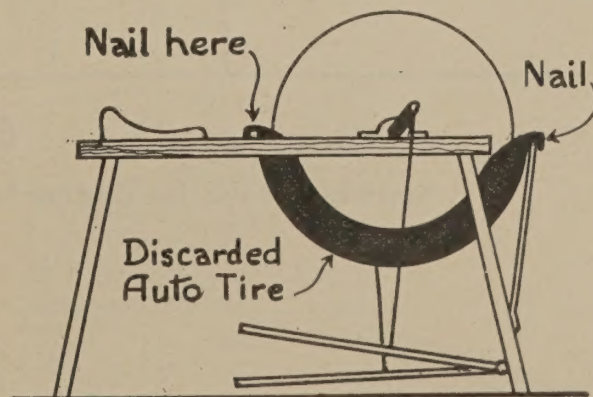
Box for Measuring Concrete Materials.

frame. This will give the correct amount of both sand and gravel to use with two bags of cement. If cleats are nailed on the inside, the partition can be slipped in and made movable for different proportions of sand and gravel. The quantity can be doubled by filling the frame twice for four bags of cement, or it can be half filled for one. A 1:2:6 mixture can be made by changing the position of the dividing board, or any other proportion can be arrived at in the same manner.

* * *

Use for Auto Tire Casing

RUNNING a grindstone thru a water bath is a great deal more efficient and satisfactory than the old method of a tin can that permits the water to drip on top of the stone. For this water



Auto Tire Casing Holds Bath of Water for Grindstone.

bath we use a part of an old auto tire casing. The casing is water tight and

is shaped so that the stone turns in comparatively deep water. The casing is attached to the grindstone frame in the manner shown in the accompanying illustration. Of course, only a section of casing that is free from holes made by cuts or blowouts should be used, but there usually is a part large enough for this purpose left in a casing that has outlived its usefulness on the automobile.

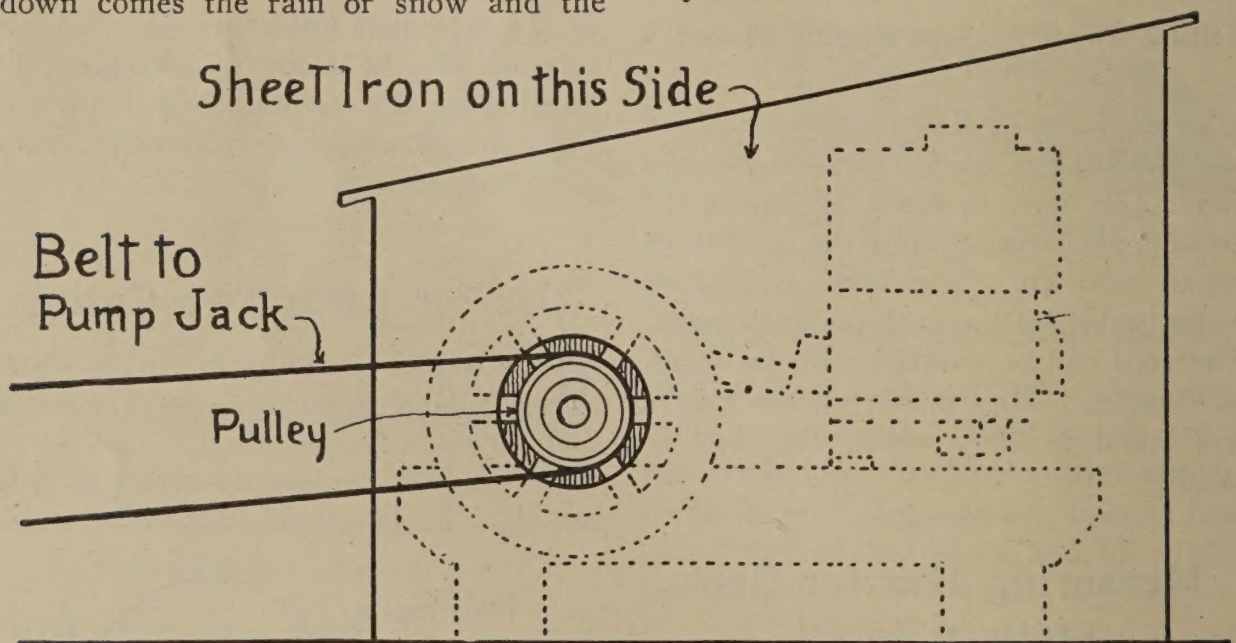
* * *

House for Pump Engine

NO doubt many of the readers of this book have a pumping engine which is not covered except with an old piece of oilcloth or a few boards for a roof, just as we had our own, but if a storm comes, off goes the covering and down comes the rain or snow and the

engine is more like a pile of rusty iron than a faithful servant. Many have a box that they lift off when using the engine, but this is sometimes unhandy and heavy. What we did was to build a house over the engine with the roof high enough to get around the engine and to crank it. Next we cut a hole large enough for the pulley to go thru and made the side, which was of sheet iron. The sheet iron enabled us to get up closer to the engine, leaving more room for the belt on the outside. The other or cranking side we made in one piece, that it may be taken out to give room to operate.

This is much handier than the oilcloth or the box house, as it can be made permanent and costs nothing but a half-day's work and a few boards and nails.



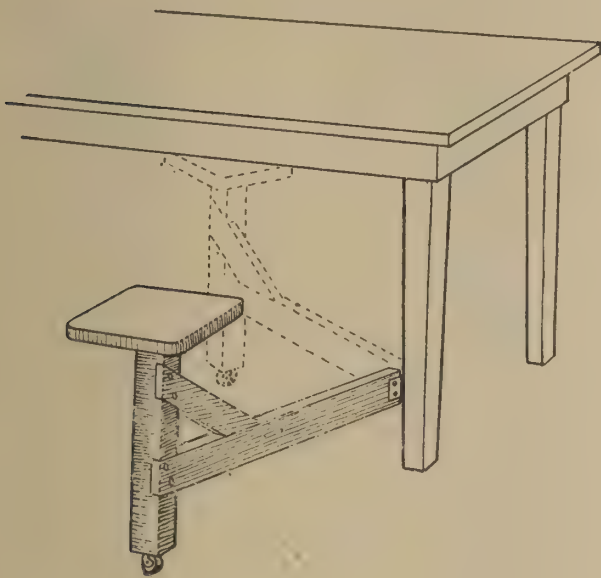
ENGINE HOUSE

Showing How the Engine Is Protected from the Weather.

Handy Andy in the Farm Home

Hinged Stool for Kitchen Table

THE housewife would frequently sit when working at the table if there were a chair or stool within reach. A



Stool Saves the Legs and Back While Working at Kitchen Table.

stool hinged to a table leg so that it could easily be pushed under the table when not in use would meet the requirement. The one shown here is a simple stool with one leg. A short arm of wood about eighteen inches long, an inch thick and three inches wide, has one end nailed or screwed to the stool leg and the other end attached to a table leg by a hinge. There is a caster in the bottom end of the leg of the stool so that a slight

push with the foot will put it out of the way under the table. It can easily be drawn out, and is always at hand. For tables with round legs a collar of strap iron may be used instead of a hinge.

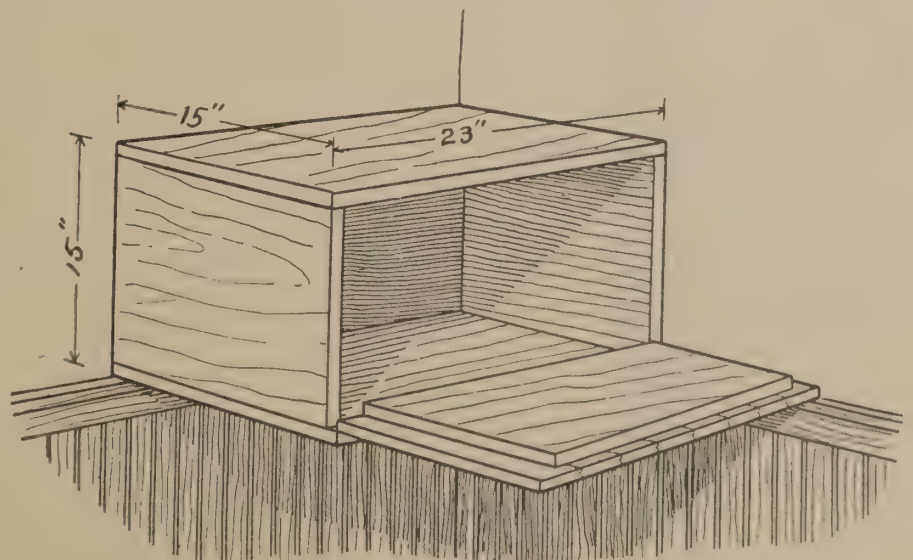
* * *

Combination Bread Cupboard and Cutting Board

MOST bread cupboards have covers hinged at the top, or doors hinged at the side. Here is one that has the door hinged at the bottom, and when it is opened it remains in a horizontal position and becomes a cutting board.

The cupboard is built into a corner of the kitchen, its bottom resting on the paneling with which the walls of kitchens are often finished. The edge of this paneling also forms the support for the cupboard door when it is opened, so that it will be held in position to serve as a cutting board.

If the kitchen is not paneled, or if there is no convenient corner, the door can be supported in a horizontal position by a small chain running to it from the inside of the box. As the cupboard is placed at a proper height, and as the



Bread Cupboard and Cutting Board.

cake and bread knives are kept right in it, the work of cutting cakes or loaves of bread is made a much easier task for the housewife.

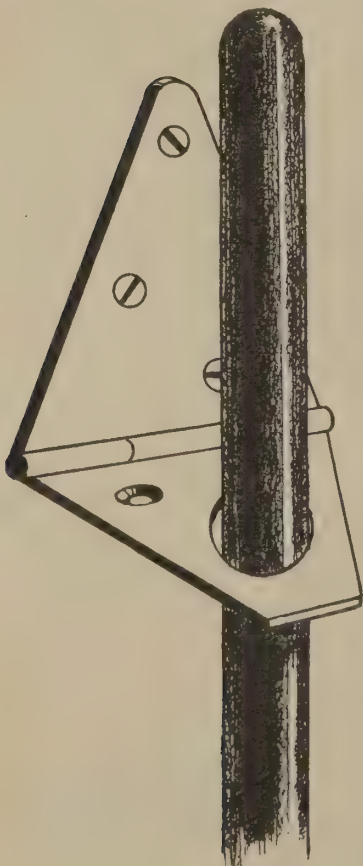
In outside measurements, the box is $15\frac{1}{2}$ inches high, 23 wide and 15 deep. Metal lining for the interior will make it more sanitary and prevent evaporation.

The door is made of a double thickness of lumber. The outside, 23 by 14 inches, is made of $\frac{1}{2}$ -inch paneling to match the room. The inside thickness, $\frac{3}{4}$ -inch stock of good, clear material, is cut just large enough to fit snugly within the walls. It may well be painted white. A catch at the top will secure the door when it is closed.

* * *

A Hinge Broom-Holder

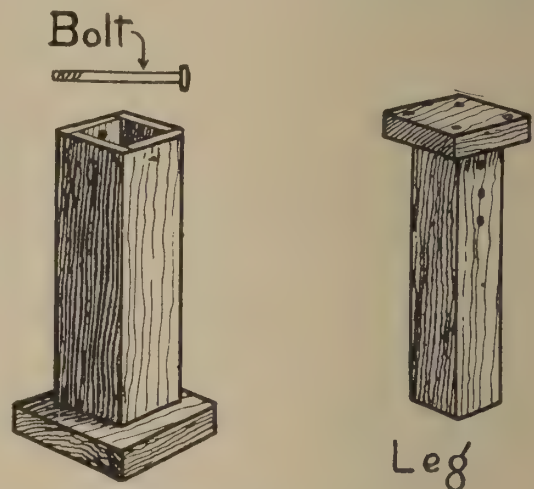
THE illustration shows how an ordinary strap hinge can be made into a very effective holder for the broom. One wing of the hinge is screwed to the wall, while the loose wing has a large hole drilled in it to receive the handle of the broom. The handle is pushed into the hole from beneath, and when released, the weight of the broom clamps it after the manner of most other types of holder.



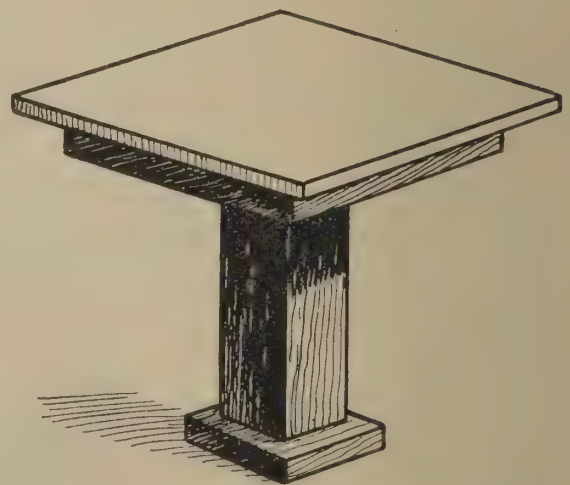
Handy Broom Holder.

A Table Adjustable in Height

A TABLE that can be quickly adjusted and securely held at varying heights is of great value in the home or office. It can be lowered for children or when used as a typewriter table, or



Hollow Pedestal



Adjustable Table, Showing the Hollow Pedestal and the Support that Permits the Adjustment.

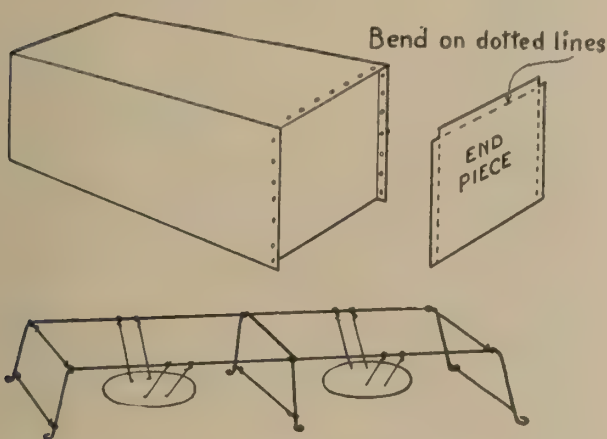
again raised for other purposes. The one shown here is supported by a hollow pedestal made by nailing together four 6-inch boards 2 feet long with a base of 2 by 10 lumber. A leg 4 inches square is bolted securely to the center of the table and telescopes into the hol-

low pedestal from the top. When the table rests on top of the pedestal it is 2 feet from the floor. It is raised by lifting the leg up in the pedestal and holding it in position by means of a bolt passing thru holes bored near the top of the pedestal and thru the leg. Several holes are bored in the leg for different adjustments, care being taken to make them so that they will strike opposite the hole in the pedestal. The leg should fit snugly in the pedestal, but not tight enough to stick. It will not be necessary to put a nut on the bolt, as the weight of the table will hold it in place.

* * *

Oven for Oil Stove

ANY "HANDY ANDY" can make an efficient oven for use with an oil stove. Get a piece of sheet iron, or heavy tin, large enough to bend to make the front, top and back. Then rivet on

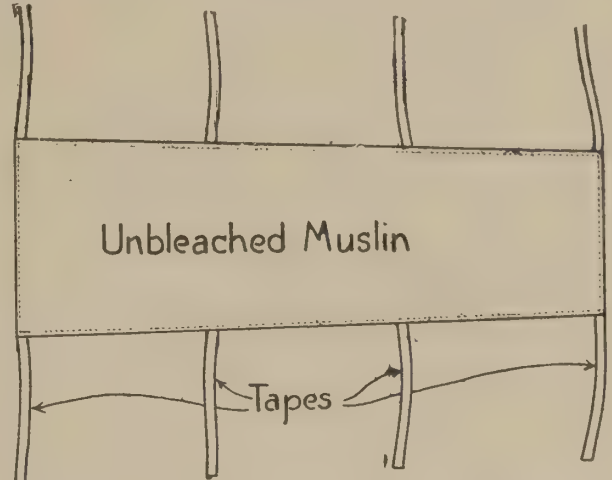


Showing the Different Parts of a Home-Made Oven for the Oil Stove.

the end pieces and you will have a metal box, 12 by 20 inches and 10 inches high. This will cover two burners. Make a stand of heavy wire, four inches high to set over the burners. Hang two metal disks about six inches in diameter, under the wire stand to spread the heat. This oven will hold three bread pans and bake well.

Ironing Board Cover

HERE is a handy ironing board cover that I use. It does not require tacking on, but is held firmly in place and does not wrinkle. Cut a piece of



Handy Ironing Board Cover Easy to Put on and Take Off.

unbleached muslin about 4 inches wider than the ironing board and shape it as shown in the illustration. Hem the ends and sides, catching the tapes in when the hemming is done. These tapes may be made of narrow strips of the muslin, doubled and stitched, or cotton tape that is purchased by the roll may be used. These covers are inexpensive, easily made and laundered and are much more readily put on the ironing board than the sheet, which has to be tacked. I find it more convenient to have two of these covers, so that one always is ready to put on.

* * *

Back-Saving Scrub Brush

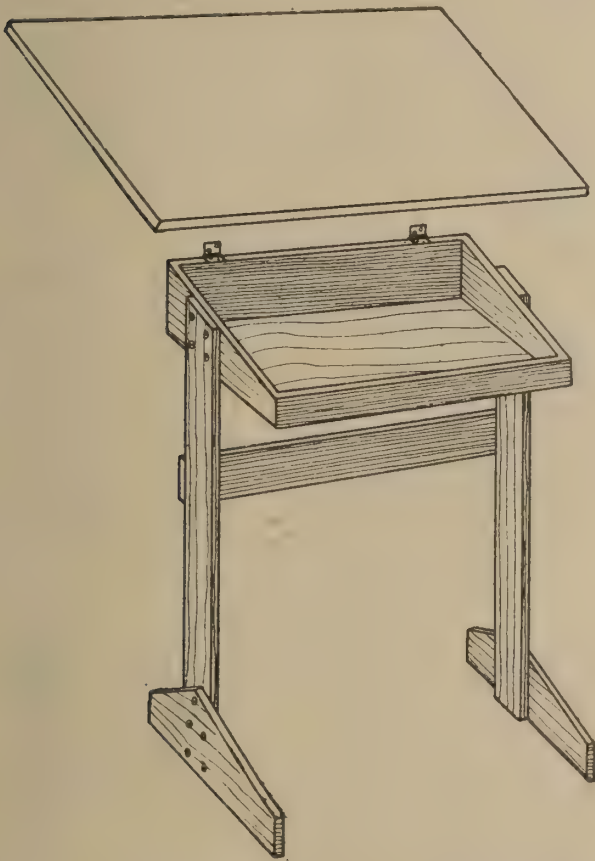
ONE of the hardest jobs of the housewife is scrubbing, as it necessitates her getting on her knees. I use a brush that is a labor-saving helper and obviates that everlasting scrubbing floors on the knees. It is made of an ordinary 2½ by 10-inch fibre brush by attaching a block of wood to the top. The block is 1½ inches thick and 2½ inches wide and 9 inches long at the bottom and

carry the article on the line out far enough to make room for the next piece. The clothes are brought in by pulling down on the line (DE) and taking off the clothes.

* * *

Shop or Home Desk

HERE is a desk that is quite handy for the shop or home. The top may be built to any size desired or made



Handy Drawing Table for the Farm Shop or Home.

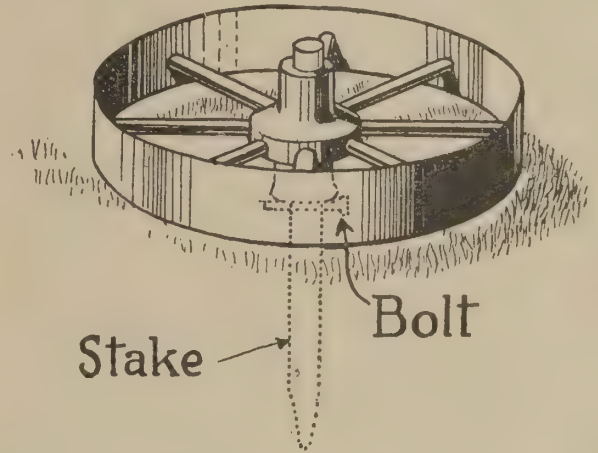
from a large drawing board. It is fastened to the frame with hinges so that it may be raised. The other parts of the desk are made of small pieces of lumber. Below the top is a built-in receptacle for writing materials, books, etc.

* * *

A Rotating Foot Scraper

THE type of footscraper consisting usually of a mat with some sort of rough surface may serve its purpose sat-

isfactorily in the city, but it has little place on the farm. Even the kind consisting of an upright blade soon become clogged in muddy weather and in a very short time must be "dug up." The footscraper described utilizes an old wheel with a somewhat broad rim. Such wheels may be found in plenty on al-



Foot Scraper Made of an Old Iron Wheel.

most any farm. This wheel is slipped over one end of a round stake which has in turn been driven into the ground. About 2 inches from the top end of the stake a hole should be bored and a bolt thrust thru this hole to keep the wheel off the ground, thus allowing the wheel to rotate and always present a clean edge. Altho the scraper will not clog enough to prevent it from turning for some time, the accumulated dirt may be easily removed by simply slipping off the wheel when such becomes the case.

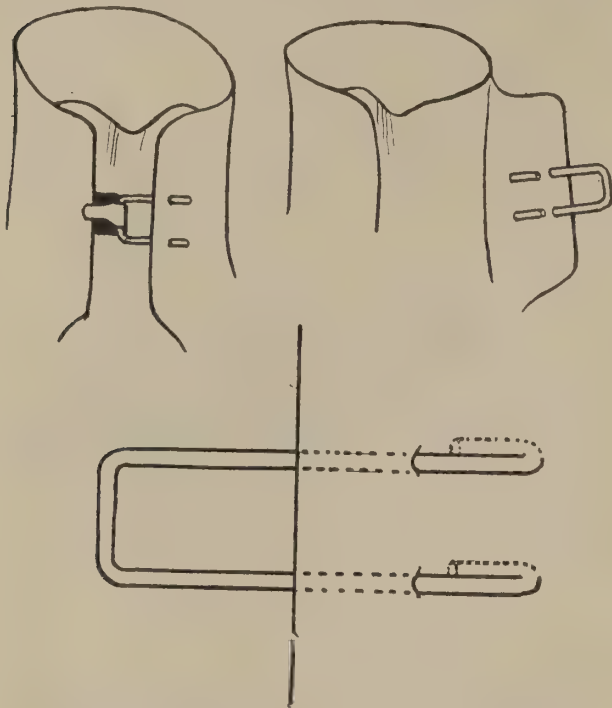
* * *

Buckles for Overshoes

MANY a pair of overshoes is being thrown away because of the buckles being off, when by just a simple little trick the buckles could be replaced without any expense.

The accompanying illustration shows how a buckle can be made out of an old baling wire. First, four holes are punched to receive the wire loop. The wire is bent in the form of a "U" and then inserted in the following method:

First, the open ends are each run from the inside to the outside thru one of the



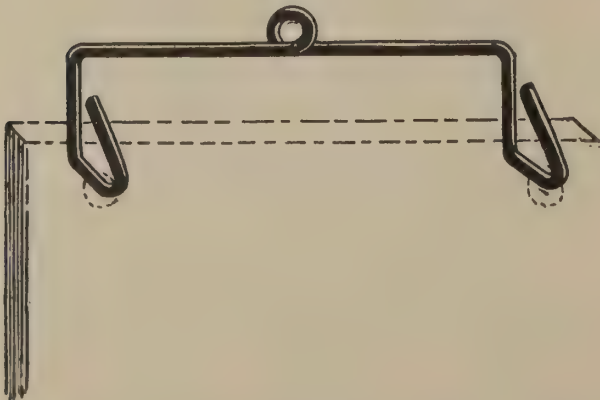
Overshoe Buckles Made of Baling Wire.

holes and then back thru the other hole, whence the ends should each extend a half inch to the inside. These ends are then bent back toward the edge of the fabric and clinched. I find these loops better than the original because the two or three idle holes on the original loops usually tend to pry the tongue of the buckle open.

* * *

Handy Andy File

I AM sending you a drawing of a wire holder I made on which I put all of



Hook on Which Handy Andy Pages Are Filed.

my Handy Andy pages that appear every month in *Farm Mechanics Magazine*.

Take a heavy wire and bend a ring on each end, but leave about $\frac{1}{4}$ -inch opening so as to put in the pages.

When I am done reading *Farm Mechanics*, I cut out the Handy Andy's pages, glue them together and put them on the rings. When I wish to make a thing I just look over the pages and it is easy to find.

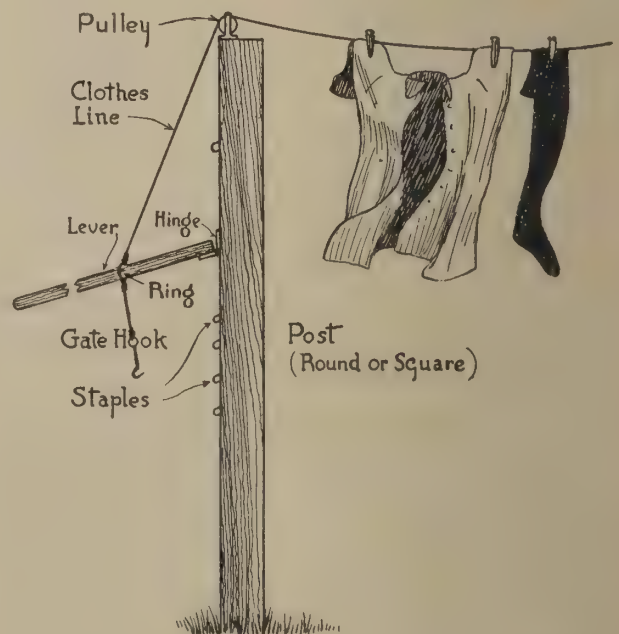
I think that the home-made harrow cart is just fine. It saves a man's legs.

There are a lot of things in *Farm Mechanics* that a man can make good use of if he will study its pages carefully.

* * *

To Tighten Clothes Lines

I N order that the housewife may have the convenience of hanging up or taking down clothes from the clothes line on a low line, I submit the following arrangement to tighten the line during the time the clothes are drying and have



Device to Hold the Clothes Line Tight.

them up high above the ground without propping up the line with troublesome poles which may blow down.

At one end of post have a lever fixed to the line or wire so that it may be

hooked and thereby hold the wire tight.

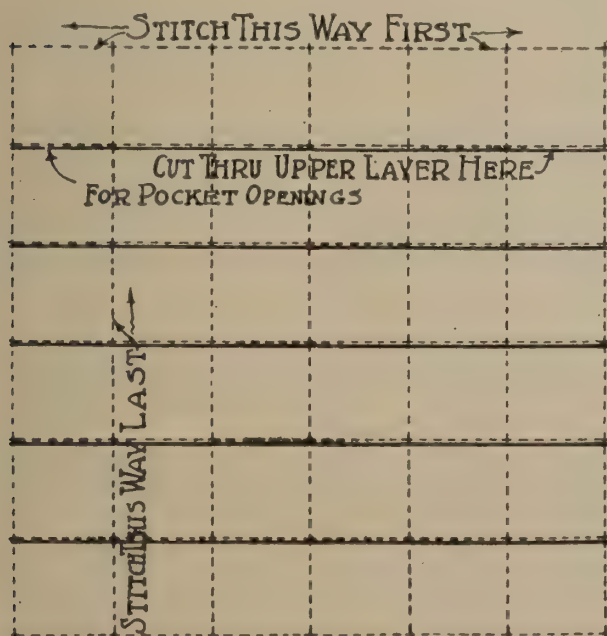
This device may be used even where the line is stretched between several posts providing it can slip freely on all except the end post to which it is firmly anchored.

* * *

Novel Seed Corn Tester

AN ear seed corn tester that I have used during the last two years has proved the best I have ever seen in this line, and I know that it will pay every corn grower to use one. The tester, which is shown in the illustration, is made as large or small as the user needs. I took two yards of muslin cloth and doubled it. First I stitched it across every $1\frac{1}{2}$ inch. Just below the lines of stitches I cut the cloth. Then I stitched it the other way, making pockets in which to place the corn to be tested. A two-yard piece of muslin provides 576 pockets.

To fill the tester I start at the lower left-hand corner, putting two or three kernels from an ear in each pocket. The ears of corn from which the kernels are taken are laid side by side on the floor or shelf. When the pockets are filled,



Seed Corn Tester Made of Cloth, with Pockets for the Kernels.

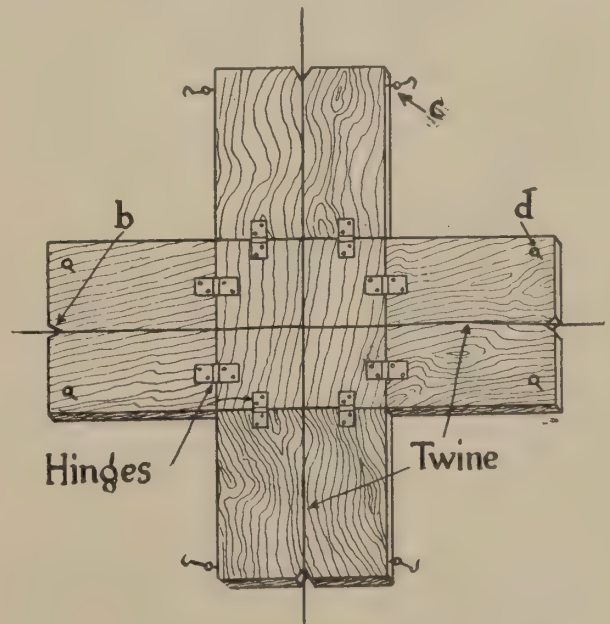
the tester is doubled and then rolled. The whole is given a good soaking in water a few minutes every day and then rolled in a dry cloth and kept in a warm room. In four or five days the kernels will be well sprouted if they are fertile.

When the tester is opened and the kernels taken out they should be removed in the reverse order, each ear that supplied fertile seeds being laid to one side, and those from which infertile kernels were taken thrown away. Care should be exercised so as not to get the ears mixed.

* * *

Wool-Tying Device

A DEVICE for tying up the fleeces after being sheared may be made by taking five pieces of 1-inch boards, 12 or 14 inches square, and hinging them together so when folded up they will make a square box with top open. Saw



Device for Tying Up Sheep Fleeces.

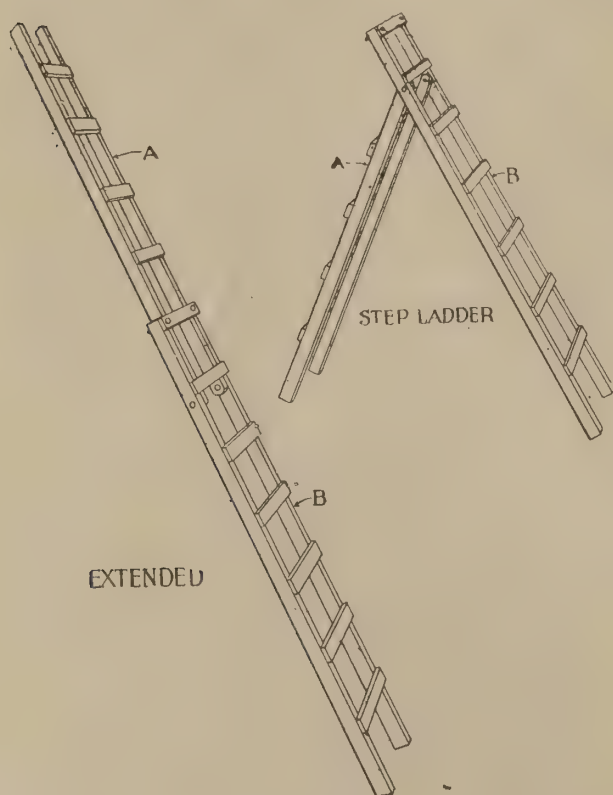
a short notch at the center of the outer edge of each leaf at b. Fasten four half hooks on two leaves opposite each other at c. And put four eyes on the remaining two leaves at d. To operate lay it flat on a table, and lay down two lengths of twine, crossing them in the center, draw down in notches (b) to hold them

in place, allowing enough end to tie. Lay on the fleece, pelt side down, gather all scraps and roll the wool to center from all sides. Then bring up the sides of box and hook them together. Tie your twine crossways, and you have a nice compact bundle.

* * *

Convenient Combination Ladder

A COMBINATION stepladder and extension ladder is shown here. Two ordinary ladders, one a foot



Combination Step and Extension Ladder.

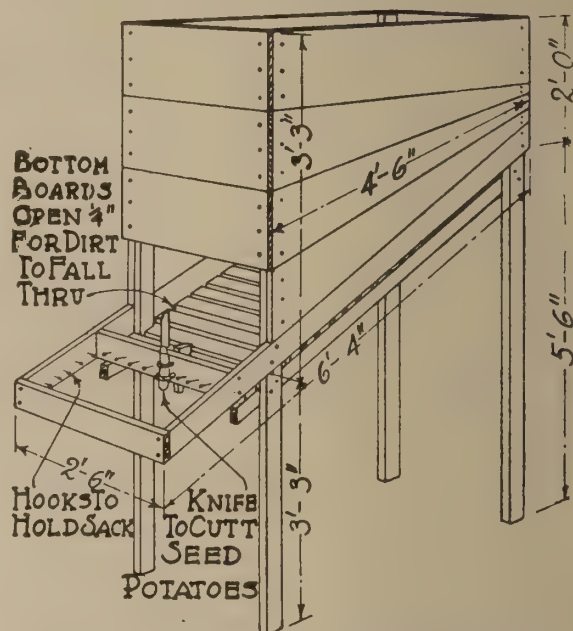
longer than the other, are fastened together by means of two short bolts thru holes in the side pieces. The shorter ladder is also the thickness of the side pieces narrower than the other, so that it fits snugly between the two when extended full length as an ordinary ladder. The top rung of the long section (B) is bolted on, making the extended ladder strong and safe. The bolts act as hinges, so that the ladder can be made to form a stepladder

by simply letting the upper section drop down.

* * *

Seed Potato Cutter

CUTTING seed potatoes by hand is quite a job, if a big acreage is to be planted. It is tiresome and dangerous, especially if one uses a sharp knife. More than once the writer has cut his fingers and hands, when the knife slipped. However, the accompanying



SEED POTATO CUTTING BOX

How to Build a Seed Potato Cutter.

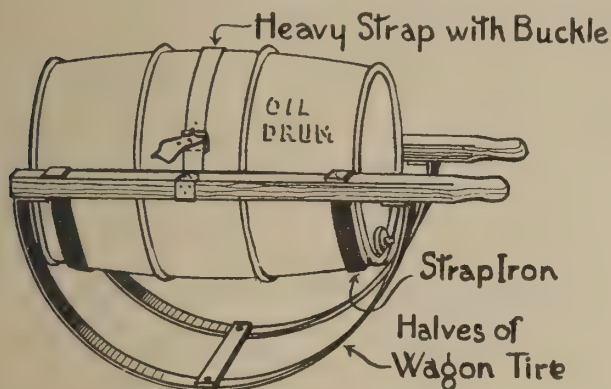
sketch, not only does away with the possibility of cutting oneself, but makes the job easier.

This box can be constructed cheaply and lasts for years. All that is needed after it has been built is a sack to catch the seed and a sharp knife to use in cutting. The bag is placed in the front of the box, on hooks or nails driven into the frame for that purpose. A knife, held in place by slipping the handle into a pocket made by two leather straps, makes it quite easy for one to sit down and pull the potatoes against the knife, and then to drop the halves into the open bag.

Handy Andy in the Garage

Rig for Oil Barrels

OWNERS of tractors, trucks, automobiles and gas engines will find the oil barrel or tank rig shown in the



Rig for the Farm Oil Barrels.

accompanying illustration most useful as well as economical. Everyone who has handled oil on the farm will readily see how the use of this device for mounting a barrel will enable him to get the last drop out of the barrel without great physical effort. This rig is made of two stout poles and an old wagon tire cut in half. A heavy strap and buckle and two pieces of iron hold the barrel or oil drum in place. By strapping the barrel onto this device a man or boy can easily tip the barrel so that the oil will flow into a can or pail. When a sufficient quantity has been drawn it is tipped back into an upright position, in which there is no danger of leakage.

* * *

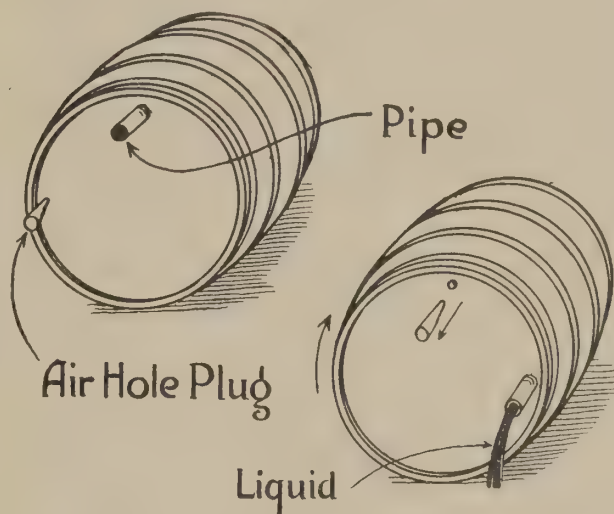
Barrel Without Faucet

MEN on farms and ranches have many heavy barrels containing oil, sheep dip, kerosene, lime-sulphur, etc., to empty and at times a faucet may not be at hand. Now, by the following method I find that any quantity of the contents may be drawn from a heavy barrel without lifting and without waste.

Secure a piece of $\frac{3}{4}$ -inch pipe with one

end threaded. It should be eight to twelve inches long. Now place a chunk under one end of the barrel so that the contents will fall away from the upper portion of the head near the chime. Then bore a hole thru the head with a $\frac{7}{8}$ -inch bit. Now turn the threaded portion of the pipe into this hole.

When ready to draw off any of the contents just roll the barrel a little until the liquid starts to run. When sufficient has been drawn just roll the barrel back to a position where the pipe is uppermost and contents will stop flowing.



How Barrel Without Faucet is Tapped.

No hard work or lifting is needed. An air hole may be bored with a $\frac{3}{8}$ -inch bit about twenty inches from the pipe. This will increase the rate of flow. After the barrel becomes lighter it may be rolled up an inclined plane onto a platform.

* * *

Tool for Changing Automobile Tires

CHANGING the tires on demountable rims can be done easily with the simple, home-made tool shown in the illustration. This tire changer is made of two pieces of sheet iron, each 10

inches long with a hook at one end and a hole at the other as shown in Fig. 1. The third piece of iron is 12 inches long, with two holes drilled in it at one end

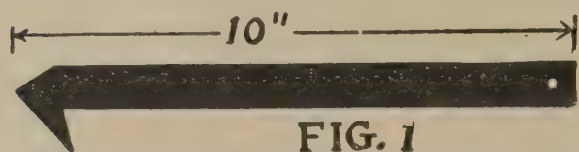


FIG. 1

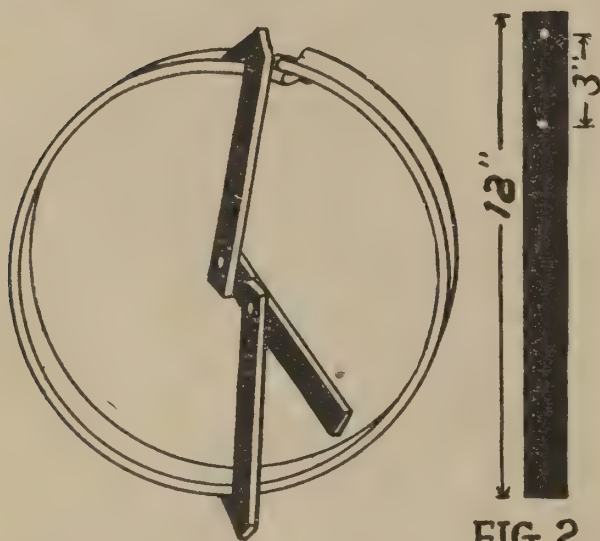


FIG. 2

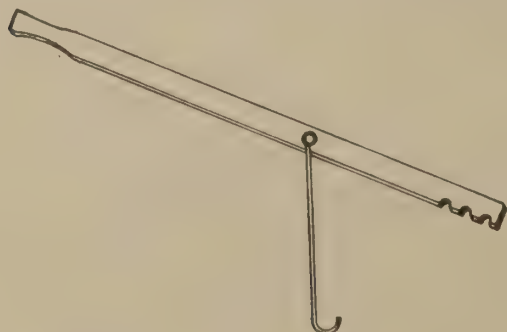
Simple Tool That Makes Auto Tire Changing Easy.

3 inches apart, as shown in Fig. 2. The three pieces are bolted together, the center piece being used as a lever similar to a jack. With this tool the rim may be compressed and the tires changed in a few minutes.

* * *

Tool for Fastening Tire Chains

PUTTING on the tire chains with the rain pouring or the snow blowing is



Simple Tool Is Great Help in Putting on the Chains.

not a pleasant task. Often when the chains must be put on under such conditions the motorist takes the chances of skidding rather than put the chains on under such circumstances.

But with the home-made tool shown in the sketch it is no trick at all to put the chains on. It pulls the ends of the chain together with one pressure.

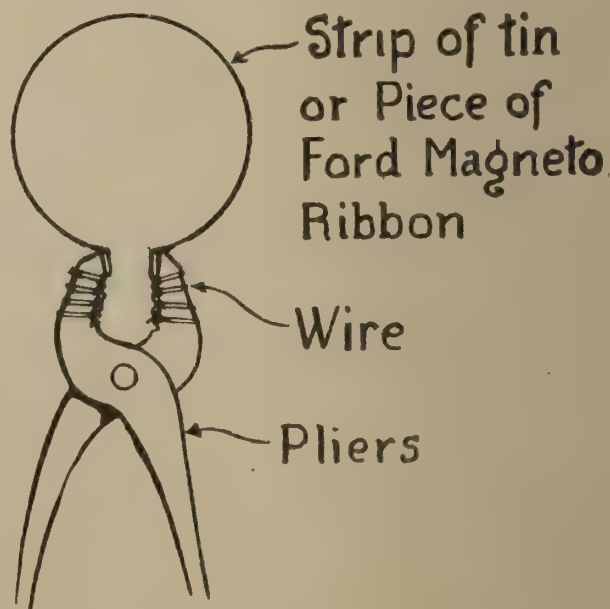
It consists of a piece of flat steel with notches in one end as shown, to which is fastened a stiff wire or a small iron rod, by a bolt or rivet. The wire has a hook at one end, as shown.

You will not take the chances of skidding if you have this tool in your kit. It also helps to remove rims and tires.

* * *

Piston Ring Compressor

WHILE overhauling my car recently, I found I had no piston ring compressor and was forced to improvise one. It did the work so effectively that I am passing it along to



Piston Ring Compressor.

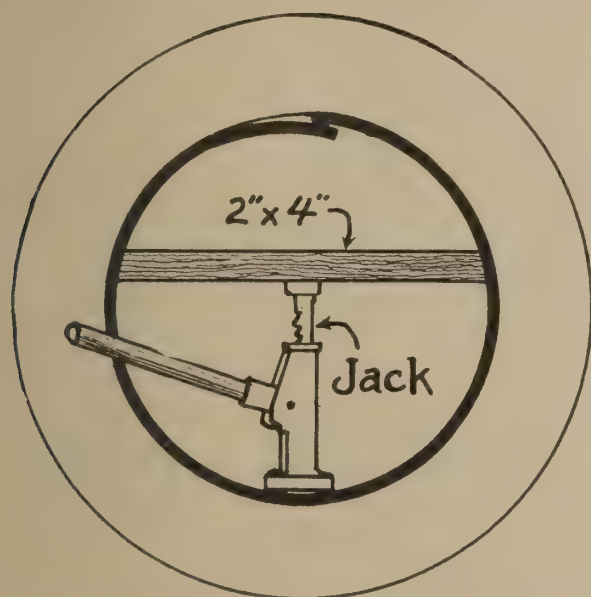
other automobile owners. I took a strip of magneto ribbon a little longer than necessary to reach around the ring, and bent it to the correct size. The ends were wired to the inside faces of plier

jaws. By closing the pliers with the ribbon around the ring it was compressed so that it could be put in place without difficulty.

* * *

To Mount a Tire on Demountable Rim

THE illustration shows a simple method we have devised to mount a tire on a detachable rim, and we have



How Jack Is Used When Putting On Tire.

found that this makes the job an easy one. Lay the rim flat on the ground and put the tire partly on it. Then take a piece of 2x4 plank just long enough to fit in the rim about two inches above the center. Put the car jack in the center of the rim as shown, and lengthen it gradually at the same time pushing the tire into place. Continue until the tire is on and the ends of the rim come together.

* * *

Extension Oil Can

PRACTICALLY every farm machine has one or two oil holes that are hard to get at, even with an oil can with a long, curved spout. Here is a method of getting at these holes that I

have used for some time and have found to be a saver of time and disposition. Take a copper wire two or three inches longer than the spout. Bend the wire at right angles, as shown in the illustration, and insert the bent end into the can. Then put on the spout over the wire. When the can is tipped spout-side down, the wire will fall out, making an extension of two or three inches. The bent piece does not allow it to fall out.

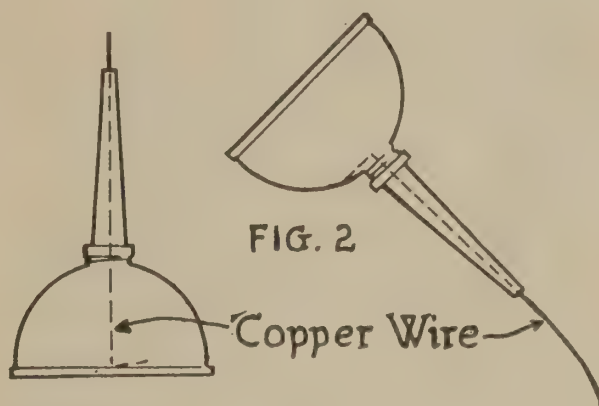


FIG. 1

Oil Can Equipped with Wire.

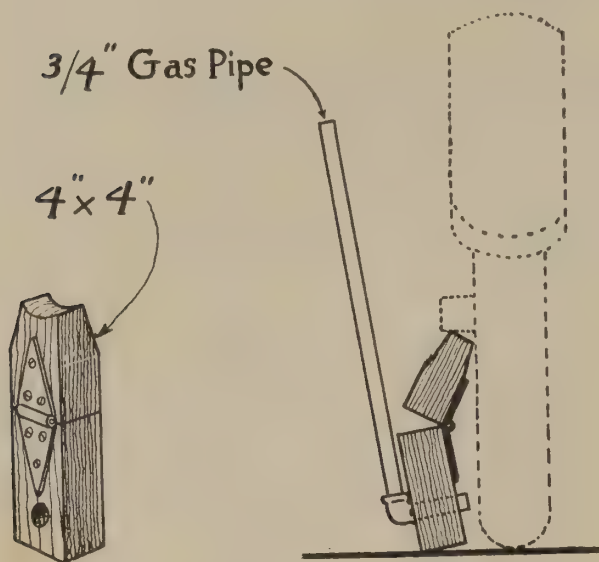
Lubricating oil of all kinds will follow the wire after it leaves the spout, and almost any out-of-the-way oil hole may be reached.

* * *

Jack Up the Auto in Storage

MOST automobile owners will agree that the tires of their machines will last longer if the weight of the car is not left on them during the winter, or when they stand in the garage for any length of time. The air pressure is likely to become low, and the side walls of the tires are therefore bent and weakened. In the shop some stormy day you can soon make a set of four tire-saving jacks, such as the one shown in the illustration. They should be made of two 4 by 4-inch blocks, securely held together by a strong strap hinge. The top of the upper section is cut out to fit the hub of the wheel, and the two blocks

should be slightly longer than the height of the hub. By boring a one-inch hole thru the lower section of the jack a one-inch pipe with an elbow and nipple



Homemade Jack for the Auto Garage.

can be used as a lever. To operate, the jack is tilted on the hinge, and then pressed together by the lever, raising the wheels slightly.

* * *

After the Collision

NO matter how careful a driver may be, sooner or later the car will need repairs. And a collision is liable to happen, resulting, usually, in a bent frame member. And in such cases the car owner, if he be not an old hand at the game, begins to sadly figure as to whether or not he "has the price" for straightening the spring horn or dumb iron.

And yet, if the frame be bent forward of the radiator support, it's an easy and simple matter to do the repairing, providing the metal is not cracked. However, if the frame side be cracked, you can force it to its original position, and have the cracks filled in with metal by means of oxy-acetylene. But if it is bent only, then do as I did a short time ago.

I ran my car into a truck, resulting in a bent frame member, as shown in

sketch. I removed the radiator, the springs and the front axle. I supported the front of car with blocking. I raised the body about five inches above the chassis at front end, in order that I might place several strands of large wire around the frame member, which acted as anchorage for a 6 by 6 piece of timber used for straightening the side members.

Next, I placed a piece of sheet steel under the frame, with a box covered with firebricks as a support. I made a rough imitation of a furnace with more firebrick, and placed charcoal around the bent place in frame. I borrowed a gasoline blow torch, and with this and the charcoal, plenty of heat was generated to bring on a cherry red heat in the bent frame, for about three inches on each side of the bend. Then the torch was removed, and while the boy used the jack, which I had placed against a block resting under frame member, right un-

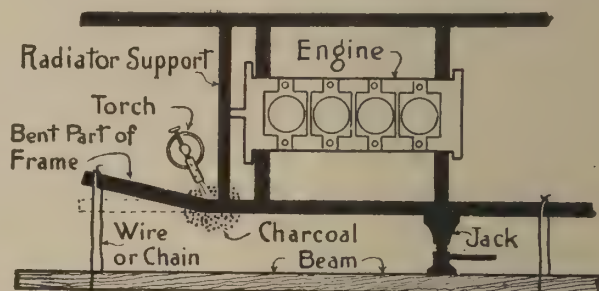


Diagram Showing Method of Straightening Auto Frame.

der where engine support was bolted, I hammered, lightly, the heated spot, until it was brought back into perfect shape. I was careful to use a piece of wood to hammer on, against the frame member, so that it would not dent the heated metal—hollowed out to fit metal.

The boy having worked the jack carefully, the bend was repaired in one heating, but this cannot always be done, and as no pressure must be applied except when frame is red, usually the torch must be applied the second and sometimes a third time. Always apply a block of wood between the frame channel so the heavy wire strands or

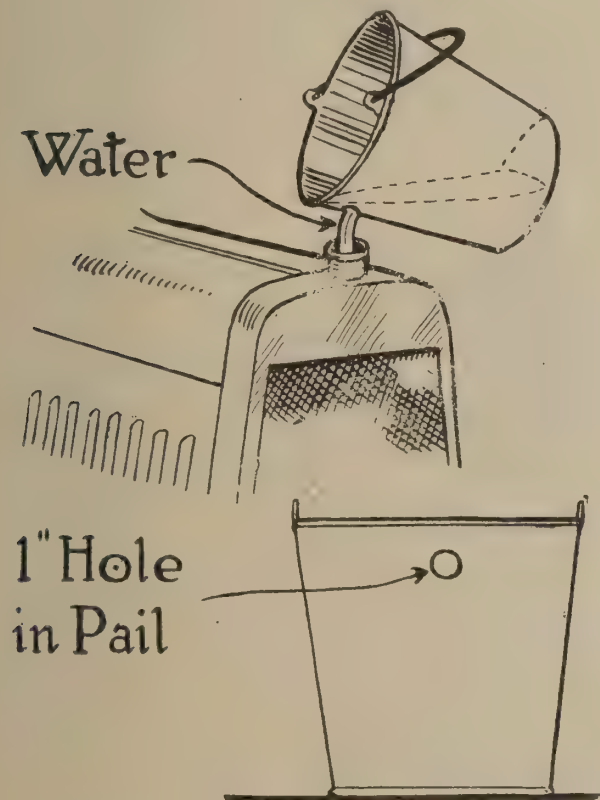
chain, whichever you use, will not mash the metal with the strong pressure.

The sketch shows just how a quick and satisfactory job of this sort may be done. It takes but a short time, and very little expense.

* * *

Radiator Filler

OFTEN when one goes to fill the radiator of an automobile, the funnel has been misplaced. To use a pail usually means that most of the water is



Pail for Use When Filling Auto Radiator.

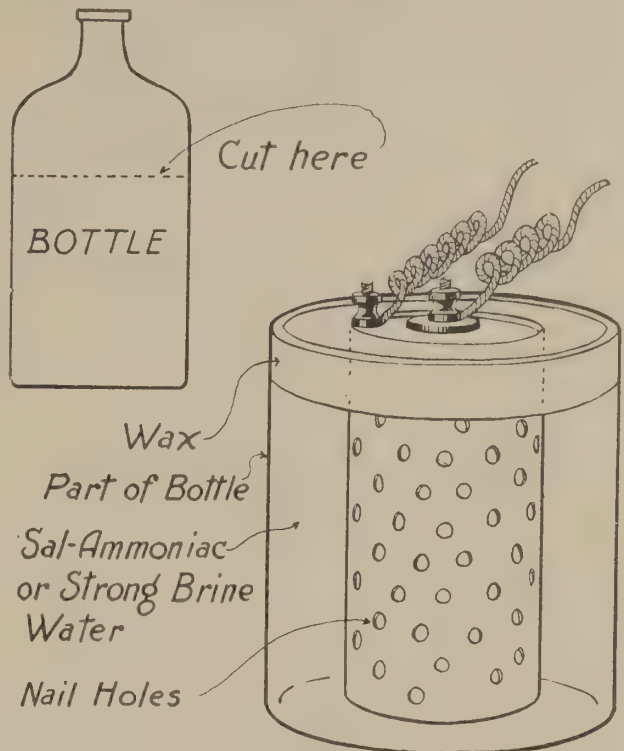
spilled over the radiator and hood. A combination pail that acts as a funnel as well is shown in the accompanying drawing. A 1-inch hole is made in the side of a pail, near the top. When used to fill the radiator this hole permits a stream to flow that is just about the size of the mouth of the radiator.

* * *

Re-using Dry Batteries

HERE is a way to get longer life out of your old dry batteries. Cut off

some old, large glass bottles, as shown in Figure 1. This can be done by tying a kerosene soaked string around the bottle at the point desired, igniting the string, and, as soon as it has burned out,



How to Restore Old Dry Batteries.

dipping the bottle into water, and then striking it a light, sharp blow against the edge of a table.

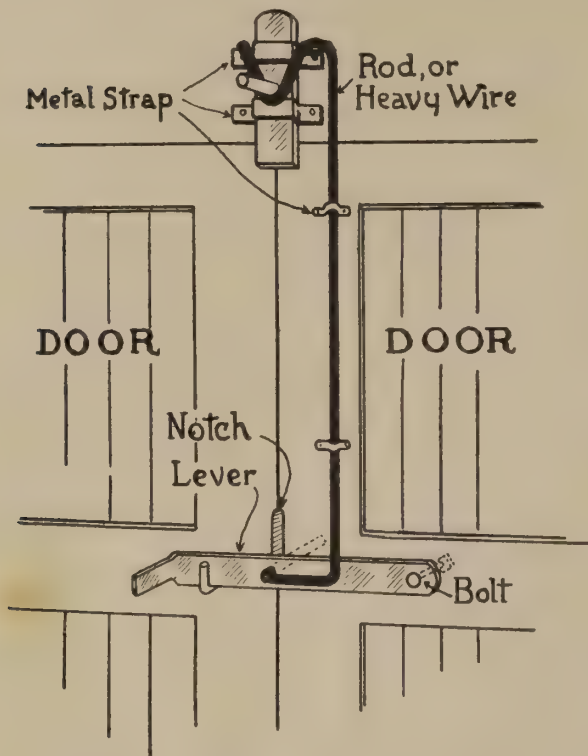
Punch a lot of nail holes in the zinc casing of your old dry batteries and set them in the bottles. Cover them two-thirds high with strong brine water or sal ammoniac, and seal the top with common wax. The batteries will be good for the next six months.

* * *

Swinging Door Fastener

SWINGING doors on the garage, barn or shed often become warped and the ordinary fastener does not hold them tightly shut. That was the case with the doors on our barn, so I devised the fastener shown in the accompanying drawing. This holds the doors shut and prevents them from letting the weather in at the top. Two pieces of strap iron hold the catch at the top. The long rod, bent as shown in the illustration, is at-

tached to the latch. When the latch is raised the catch is lifted, allowing the doors to swing free. The V-shaped rod



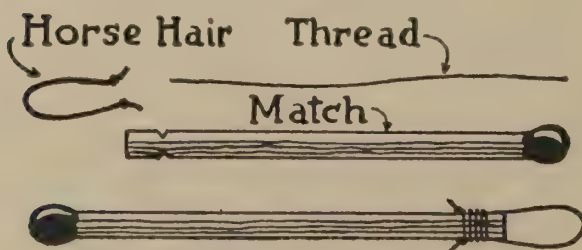
Fastener for Swinging Doors.

pulls off the projecting rod in the catch. When the doors close the rod lifts up the catch and drops it in place after the doors are shut.

* * *

Cinder Remover

I AM unlucky in the general run of things in only one respect—that of continually getting things in my eyes. Frequently out in the field I have to help myself, and digging around in your optics with a pointed match end is dangerous. I took a horse hair and made



Small Instrument for Removing Foreign Substances from the Eye. It is made of a match and a horse hair.

a loop of it, tying the ends to the sides of the match with fine thread. With the aid of my small pocket mirror I could then scrape and drag around the eyeball without the least bit of danger. The bits of dirt seemed to stick to the hair better than to a wood point or twisted handkerchief. If the eyes do not water readily on the presence of foreign matter the above is very handy where you have to be your own doctor.

* * *

Pull Out the Car

WHEN you are out having a joy ride and get into a bad piece of road and bad ruts, or meet another car, so

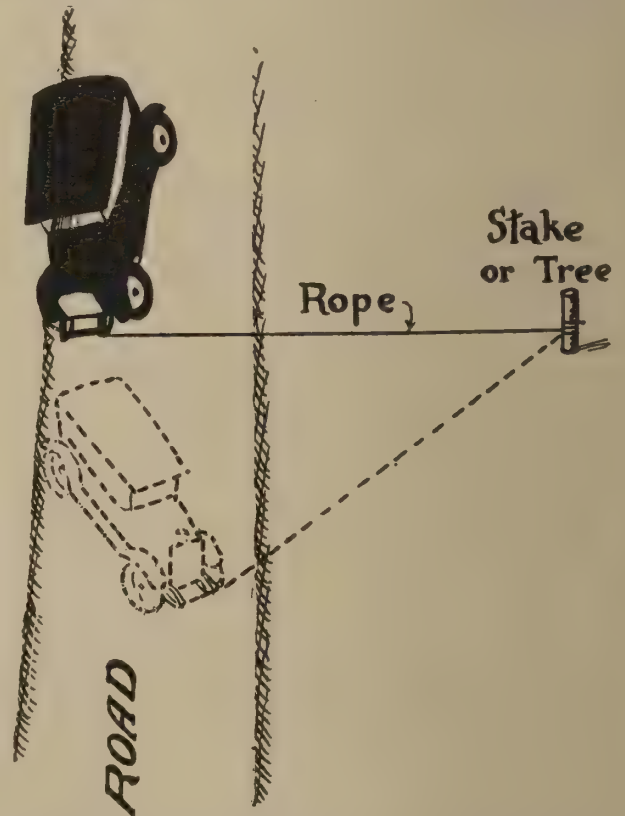
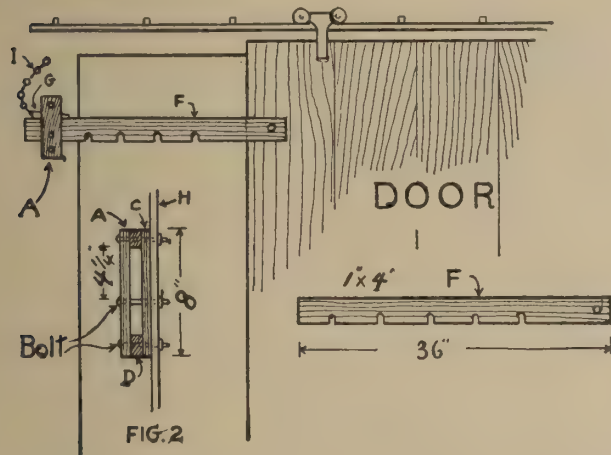


Diagram Showing How to Rescue the Auto.

that neither one can turn out, take your tow line or rope, hitch it to the chassis beam on front end of car, pull rope tight at right angles and hitch to tree, post, or small stake (carry a small stake on purpose) at side of road and go ahead until rope turns you out of rut or ditch. You can get out of almost any place without help.

Holds a Door Partially Open

IT is desirable many times to be able to fasten the sliding door of a farm building so that it will stay open a small distance. This may be accomplished by the use of the device shown in the ac-



Catch to Hold Sliding Door Partly Open.

companying illustration. The main drawing shows a view of a sliding door being held open, while Fig. 2 is a cross section showing the construction. F is a 1 by 4, which may be any length desired. This piece is notched, the notches fitting over the bolt, B in Fig. 2. The notched piece is attached to the sliding door and runs thru the opening, A. To operate the door is opened to the required distance and the piece dropped so that a notch catches on the bolt. This device will be found handy on a building where hogs or chickens are allowed to enter and horses and cattle are to be kept out.

* * *

Automatic Stop for Pump Engine

I AM giving a sketch of an automatic stop for the pump engine that will shut off the power when the tank is full. Referring to the sketch: The wire "S" goes to the spark plug and wire "n" to the magneto "b" is a 2 by 4 long enough to go across the water tank. "C" is a block of wood, 6 by 4 by 1 inches. with

a hole in the center the size of the rod "d"; "a" has a float on one end and a

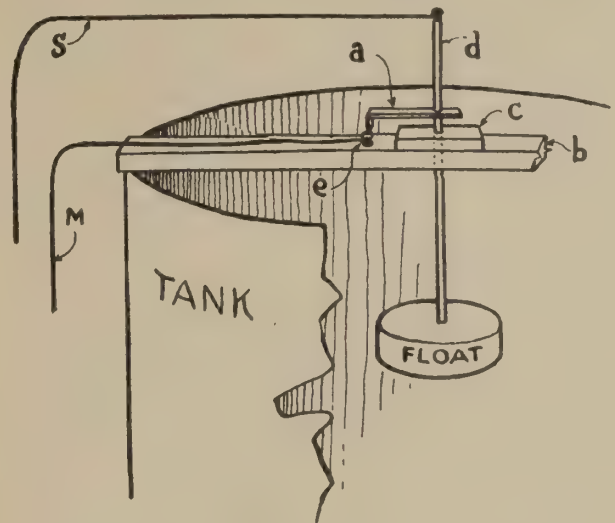


Diagram Showing How Cutoff of Pump Engine Is Made and Operates.

wire on the other, and is a piece of brass four inches long and one inch wide; "e" is a screw with the other wire attached to it. By following the sketch and using the materials here described, the making of this automatic engine stop is simple. The principle of the stop is that when the water in the tank raises the float the current is broken and the engine is stopped.

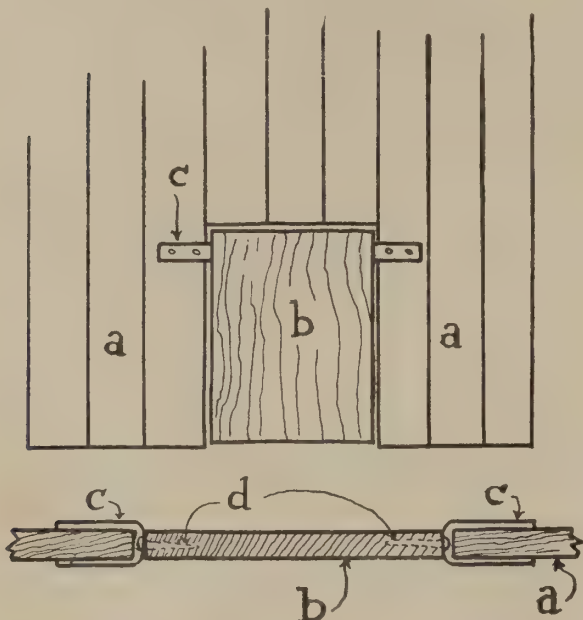
* * *

Small Swinging Door

THE illustration shows a small door which is good for many purposes. It is so constructed that it will open to both sides. It is good for use in the small exit holes in chicken houses and prevents the attendant having to be either on the inside or on the outside of the house to release the flock. It is also good in yard fences or on dog houses to keep biddy from teaching the pup how to eat eggs by laying them in his home. The reason is, that the dog soon learns how to get thru while the chicken never will.

(A) is the wall or fence and (b) is the door; (cc) are the hinges and are made of strap iron or strong tin, bent

as shown. These hinges are bolted to the wall or fence as shown, with two bolts each. But before bolting hinges to the wall, they are fastened with two large nails to the door as shown.



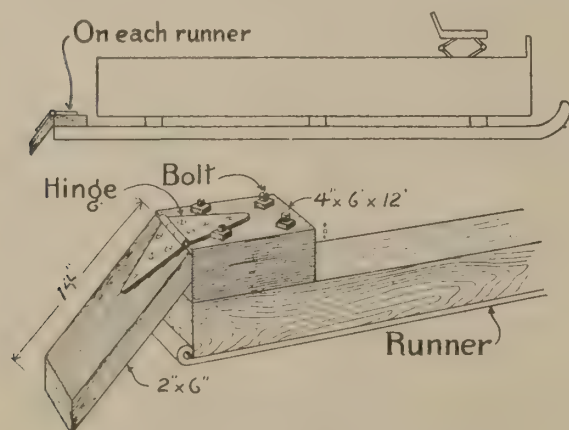
Small Swinging Door That Provides Easy Access to a Building for Animals.

I would also suggest a door like this on hog houses for cold days.

* * *

Brake for Sled

PREVENTING a sled from sliding down hill can be accomplished by the use of the device shown in the illustration. The peg is hinged to the rear end of the runner, so that it may be turned



Adjustable Brake for Sled.

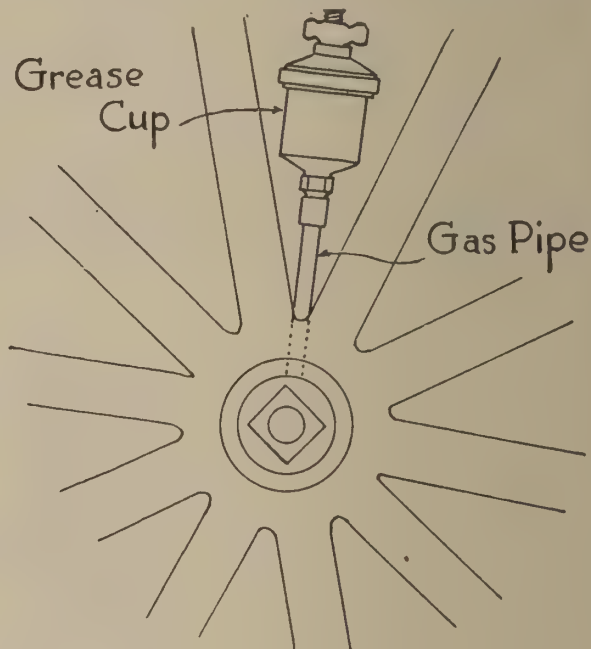
up out of the way when not in use. The device is inexpensive and easily made.

A double strap hinge is bolted securely to the runner at one end and to the stick on the other.

* * *

Grease Cup for Wagon

I HAVE found how to save time in greasing a wagon. Drill a hole down between the spokes and screw in a pipe four inches long and put a grease cup



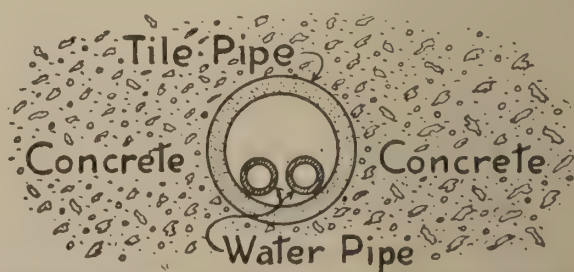
Grease Cup Set in Wheel.

on. Every time the wheels need grease instead of taking off a wheel just screw down the cup.

* * *

Pipe Under Concrete

WHEN laying water pipe in or under concrete, it is a good plan to



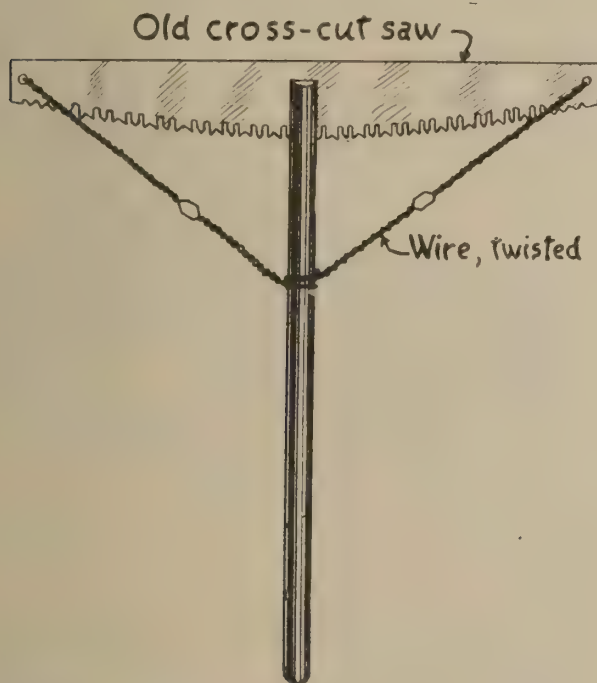
Water Pipes Enclosed in Tile Where Concrete Is Needed.

put in a strong tile considerably larger than the water pipe, sinking it into the concrete so that it will be well covered. Then the water pipe can be run thru the tile.

Handy Andy in the Barn

Barn Floor Scraper

A VERY efficient scraper for the barn floor that is of concrete can be made of an old cross-cut saw that has outlived its usefulness. The teeth edge of the saw is set into a pole, 3 inches in diameter and about 5 feet long. The slot should be of the same width as the saw blade, which is held in place with a bolt thru the wood and steel. Braces should be run from the saw on either side to the handle at an angle as shown in the illustration. If steel rods are not available, heavy wire will answer



Barn Floor Scraper Made of Old Cross-Cut Saw.

the purpose. The back of the saw when held rigid by the handle makes a scraper that will last many years and will clean off the surface of the concrete floor with little effort.

* * *

Ladder To The Hay Carrier

IF ANYTHING goes wrong with the hay carrier, the trouble is usually at the stop block. Perhaps you know the fun that follows in getting things ready

for business again. The drawing shows how time and patience may be saved. I built such a ladder in my barn and it is safe and easy to reach the carrier any time. It is so convenient and easily



An Easy Way to Get to the Hay Carrier.

made that no barn equipped with carrier should be without one.

I made the ladder on the barn floor with the lower end that fastens to the rafters at the eaves, in place. When completed, I raised the other end with the hay rope, and beginning at the bottom, nailed the hangers to the rafters.

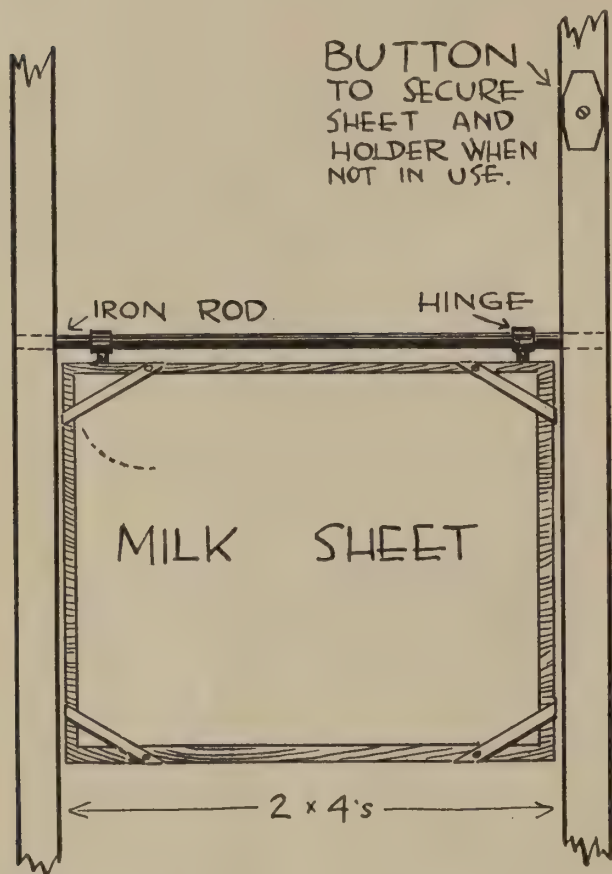
It is important to use good, long nails and to use enough of them to make everything safe. About twice as strong as it needs to be is a good rule for anything like this.

* * *

A Place for the Milk Sheet

HERE is a thing I worked out that keeps the milk sheet clean when not in use and also makes it easier to put in a new milk sheet when one is filled out. I put a rod from one 2 by 4 to the other behind the cows and then a board was sawed up so that it would just fit in between these 2 by 4's. It was fastened

to this rod by two round hinges. When not in use the board holding the milk sheet is folded up against the wall where



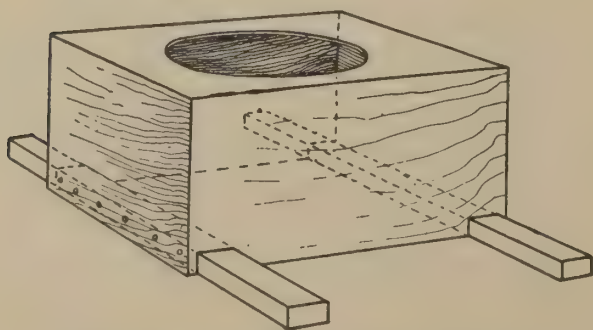
How Milk Sheet Holder Looks When Completed.

it is held in place by a button on one of the 2 by 4's. At milking time the board is let down and a pencil fastened to it makes it easy to mark down the quantity of milk produced by each cow. We do not put any tacks into the milk sheet.

* * *

To Hold Feed Pail

THE accompanying sketch shows a simple device for feeding calves



Holder Prevents the Animal from Tipping Over the Feed Pail.

from a pail without having to hold the pail.

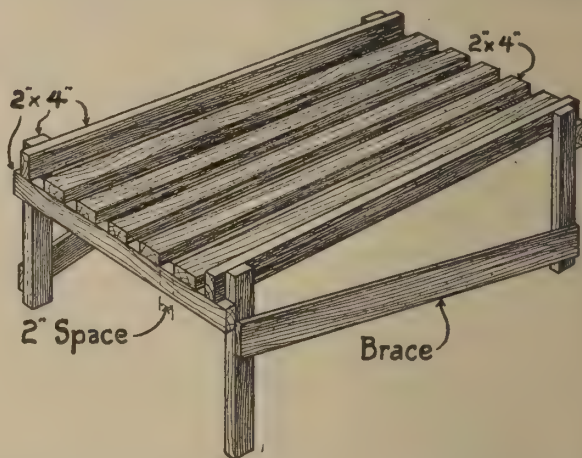
Turn a grocery box upside down and cut a round hole in the bottom and set the pail in the hole. The hole should be large enough so that the pail rests on the ground; and the box should not be quite as tall as the pail.

Such a box is also handy for feeding chickens, either from a pail or milk pan. In case of a milk pan, the rim of the pan rests on the edge of the hole.

* * *

Liquid Manure Frame

THE drawing shown is of a liquid manure frame which will prove to be a great help and money saver to the farmer who is compelled to pile his manure before hauling it to the field. When a farmer piles manure in his barn-lot not under cover and a rain comes up



Frame That Saves the Liquid Manure.

a reddish liquid, due to the rain washing over his manure pile, may be seen lying in pools about the barnyard. This reddish liquid is liquid manure and is very valuable when put on the garden around tomato plants, etc., and this frame is used for the purpose of saving this liquid manure.

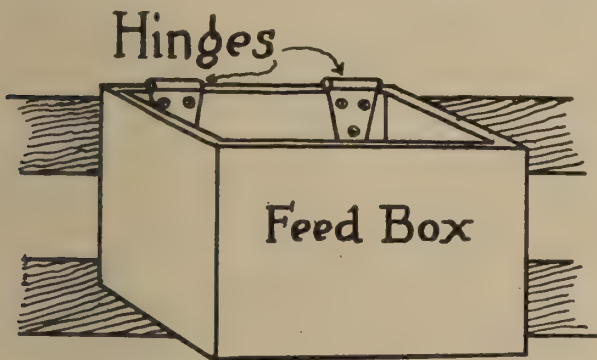
The operation of this frame can be readily understood from the drawing and it does not take a man who is mechanically inclined to put one together. A large waterproof receptacle is placed beneath the frame and when it rains the liquid manure seeps thru the spaces be-

tween the slats and is caught in the receptacle and is, therefore, available to be spread on the garden. The manure on the frame may be spread on the field and still do some good, altho some of its value is in the liquid manure. As the user will have to make the frame large enough to take care of his manure, the dimensions are not given.

* * *

Feed Box Easy to Dump

IT is inconvenient to clean out the ordinary stationary feed box. However, the inconveniences can be almost entirely eliminated if the feed box is hinged, as shown in the sketch. The



Hinged Feed Box.

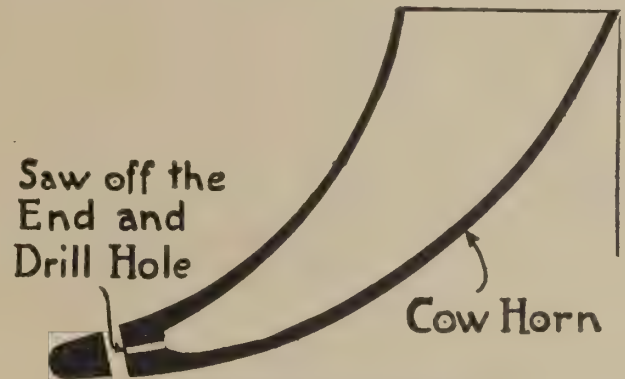
top of the box should be level with the top of the manger, post or wall to which it is fastened. Two hinges are best for the purpose and, if necessary, a hook or catch can be used to hold the box so that the stock cannot dump the feed out of the box by "nosing" it. By placing the feed box at the top of the manger, or wherever it is fastened, it may be turned bottom side up and the cobs, stale feed, etc., dumped out.

* * *

Medicine Funnel for Livestock

ADMINISTERING liquid medicine to livestock, especially cattle and horses, is dangerous when a glass bottle

is used. The accompanying drawing shows a funnel for giving medicine that is made out of a cow horn. The horn is first boiled and then cleaned out. The small end is sawed off about an inch from the tip and a small hole



CROSS SECTION

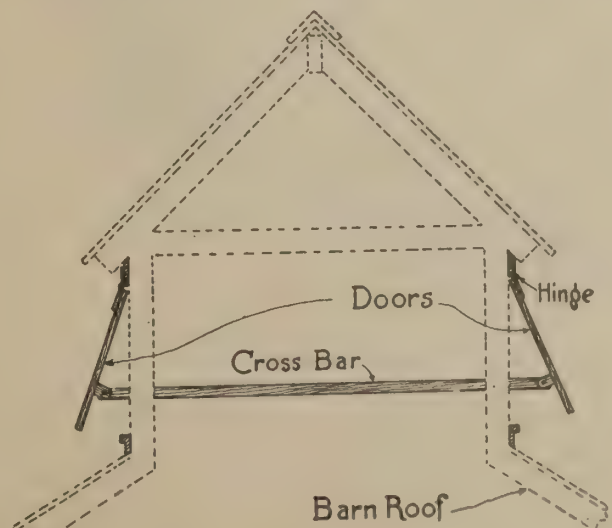
Horn Medicine Funnel.

drilled into the natural cavity. The natural curve of the horn makes it easy to tip it so the medicine will flow freely down the throat of the animal being treated. We have used a horn for this purpose for many years and have found it convenient and efficient.

* * *

Self-Regulating Ventilator

A VENTILATOR for barn, poultry house or other out building should be arranged so snow and cold wind will



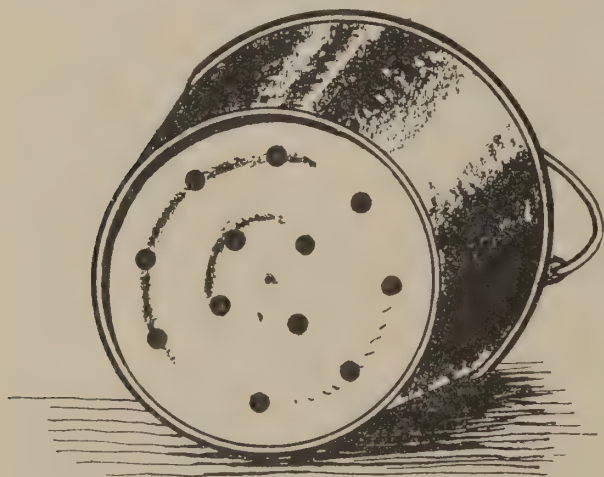
Cross-Section Showing Ventilating Windows

not blow in, which makes it necessary that the opening on the side the wind blows from be made to close automatically. Such an arrangement is shown in the illustration, and consists of an ordinary cupola with four or more sides. Opposite ventilator doors, which are joined and held slightly ajar by a cross-piece of light material, are hinged at the top. A hard wind blowing against one door will close it and open the one on the opposite side, preventing a downward draft while allowing the escape of impure air from below.

* * *

To Keep Milking Machine Clean

TO keep the milking-machine tubes and teat-cups clean and free from germs, I had a galvanized pail made large enough to hold the tubes and teat-cups. About a dozen holes, as large as a 10-cent piece, were made in the bottom. After running the usual pail of



Galvanized Iron Pail to Keep the Parts of the Milking Machine in a Sanitary Condition.

cold water thru the machine, the teat-cups are placed in galvanized pail and lowered into the well, where they are kept at the right depth in the water by means of the rope attached to the handle of the pail, the other end of rope being fastened to the pump, or anything else convenient and secure.

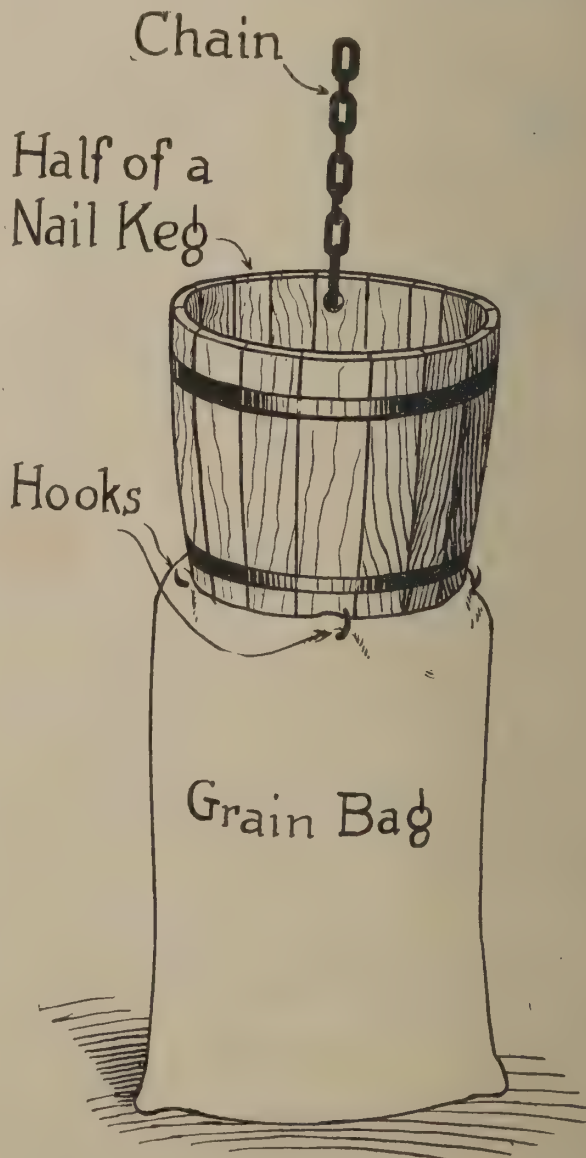
The wellwater being usually quite cold, keeps the rubber in an absolutely sanitary condition, and it is infinitely easier and probably much better than the "chloride of lime" method and the scalding and rinsing that sometimes makes milking machines more of a nuisance than a help.

I followed the above plan for five months and found it entirely satisfactory. Milk has been absolutely free from taints.

* * *

Grain Bag Holder

A SIMPLE yet efficient bag holder is shown in the accompanying



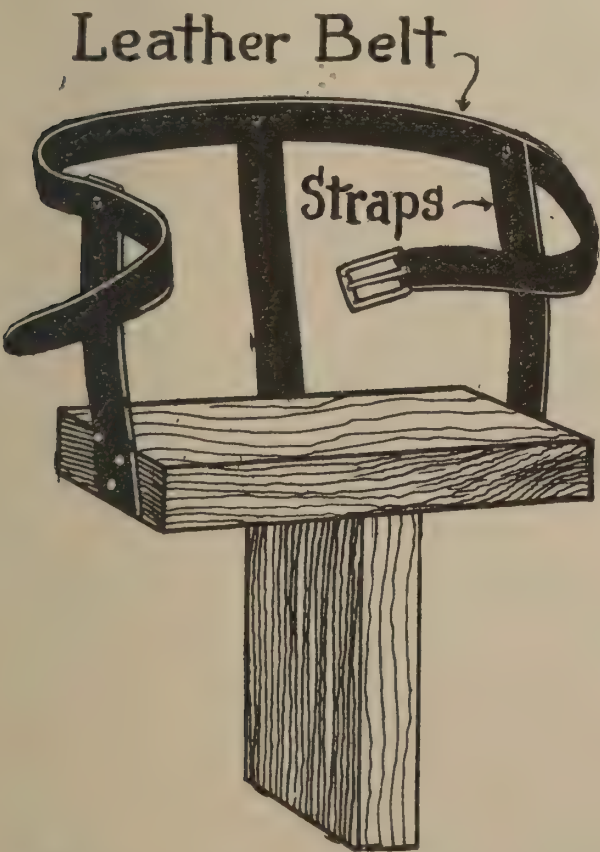
Grain Bag Holder.

sketch. A nail keg is cut in two in the middle and one of the halves is used as the holder. To avoid the danger of collapse the hoops are nailed to the staves. To the smaller end of the half-keg, several hooks are fastened and the bag is hung on them. A chain, fastened as shown, makes the holder adjustable to different lengths of bags. This holder is very similar to those used in post-offices to hold mail bags open for the mail distributors. We have used this device for some time and find that it saves a lot of trouble and makes bag filling more easy.

* * *

A Handy Milk Stool for Strippers

WHEN milking after the milking machine, the milker will find it a great convenience to make a milk stool as described herewith.



Milking Stool That Goes Wherever the Milker Does and Is Always in Place.

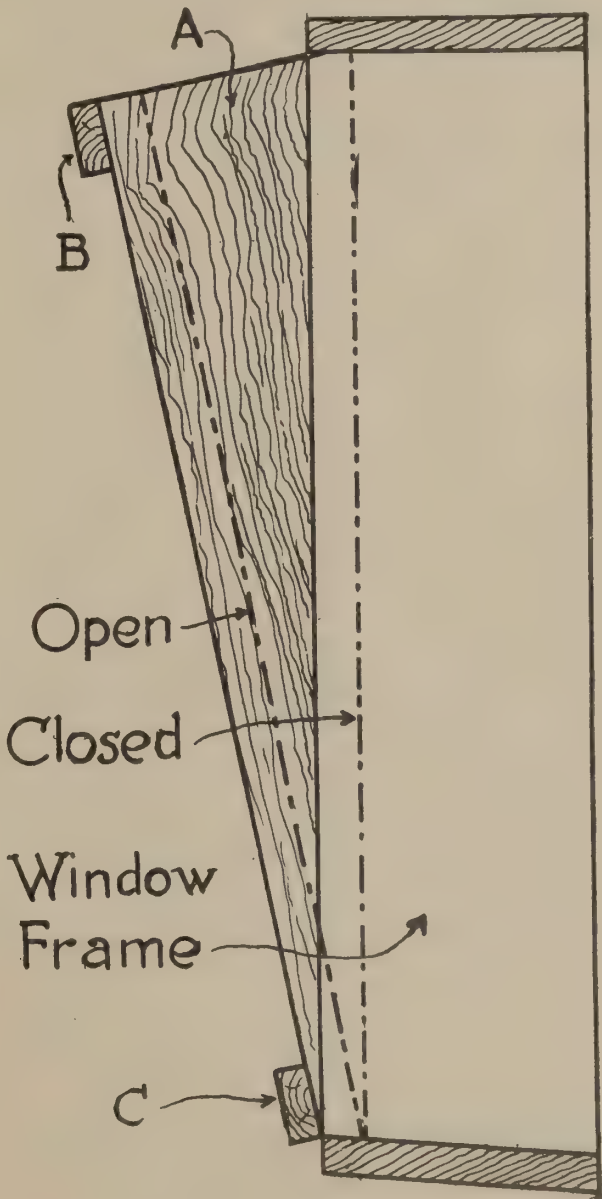
The stool is an ordinary one made from 2 by 4's and equipped with leather

belt that keeps the stool in place. When milking the milker does not have to move his stool with his hands.

* * *

Ventilating Barn Window

THE sketch shows an excellent way to fix the windows of the barn. There are no hinges and the window



Cross-Section of Stable Window Ventilator.

can be opened and closed at will or removed entirely if desired. Two triangular pieces (A) are fastened to the sides of the frame as shown. A piece (C) across the bottom holds the bottom of the sash in place. Another piece (B)

across the top keeps the pieces (A) the correct distance apart and serves as a rest for the sash when it is opened. The dotted lines show the position of the sash when open and closed. A small button fastened to the window frame at top holds the window shut, and another attached to the sash itself holds the window open. The air is forced to the ceiling and thus causes no drafts when it enters, as is the case with other methods of fixing the windows.

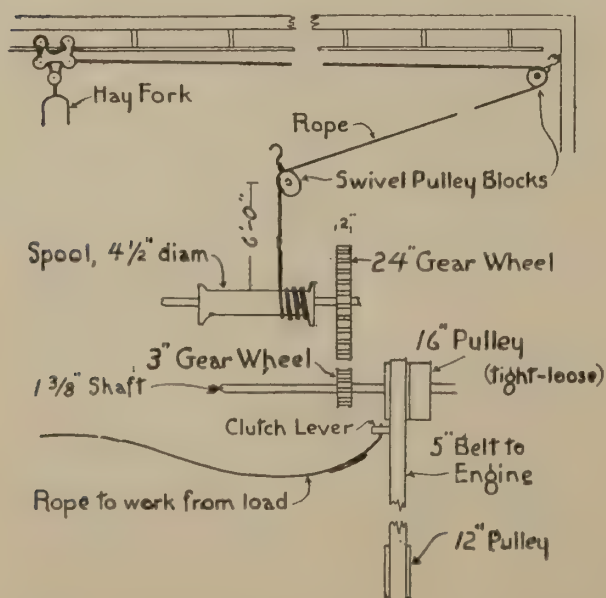
In winter a strip of cotton flannel tacked across the top of the triangular piece will prevent the barn becoming cold, and yet allow the air to circulate.

* * *

Hay Loft Tackle

I COULD not afford time to unhitch my team every time I drove in the barn with a load of hay, so I made the arrangement shown here, and now my wagon's unloaded before I could unhitch and hitch to hay fork rope.

First, my gasoline engine is 5-horsepower with 12-inch pulley and 5-inch belt, 30 feet long. Tight and loose pulleys are 16-inch. The tight pulley is connected by a $1\frac{3}{8}$ -inch shaft to a gear wheel 3 inches in diameter by 2-inch



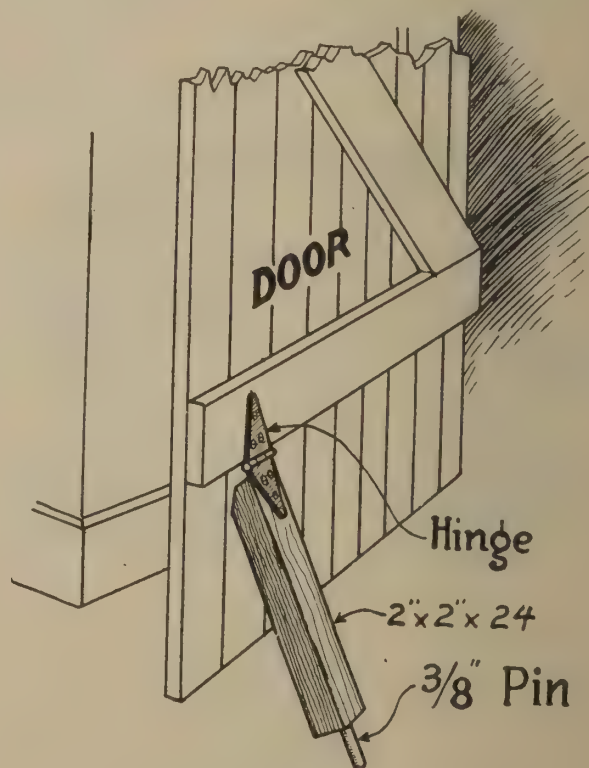
Details of Hanging Hay Loft Tackle.

face. This meshes with a 24-inch diameter, 2-inch face gear, to which is attached the spool. The spool is $4\frac{1}{2}$ inches in diameter and should be long enough to wind all rope needed. The rope runs from spool to pulley block hung opposite center of spool and about 6 feet from spool, then to another pulley block at far end of hay fork track and is attached to fork. The machinery inside should be hung even with top of barn door with a rope from clutch belt lever to wagon.

* * *

Swinging Door Holder

SWINGING doors, on the barn, corn crib, hog house or other farm building have a habit of blowing shut at inopportune times, unless they are held open by a prop or stone, or some other



Brace for Barn Door.

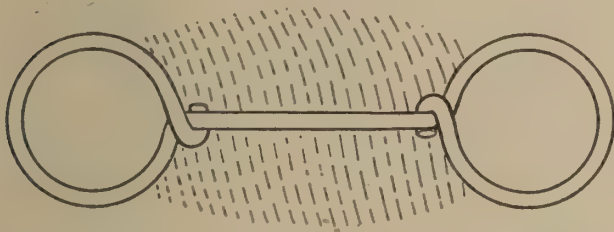
object. Shown in the illustration is a little door stop that is attached to the door. I have used this for some time and have found it efficient. At the bottom of the door on the inside, nail or screw on a double strap hinge. To

the lower strap attach a piece of wood, a 2x2 being about the right size to give it strength. Into the end of this piece of wood drive a piece of $\frac{3}{8}$ -inch rod, allowing it to penetrate about 2 inches. This also may be used for swinging gates. I have found this to be about as handy a little device as there is around the farm, as, when I want a door or gate to stay open, all I have to do is to turn down the stop and the more force that is exerted on it the more substantial it is.

* * *

A Wire Line Holder

A HOLDER upon which a line of any kind may be wound, such as a carpenter's chalk line, fishing line, or



Wire Holder for Line of Any Kind Is Made of Heavy Wire, Bent as Shown.

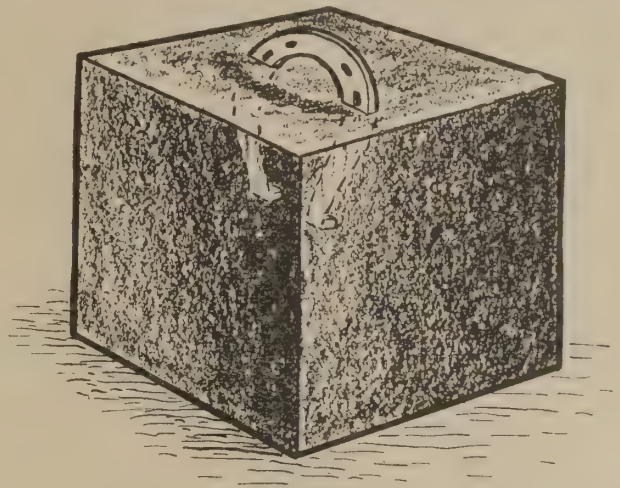
cord used for any purpose, may be easily and quickly made from a short piece of No. 9 or No. 10 wire. The illustration shows how the wire is bent to form the holder. The end rings provide means for tying the loose end of string, as well as for holding or hanging the wound line.

* * *

A Cement Hitching Weight

A VERY serviceable weight to tie a horse to when left standing, may be made of cement with an old horseshoe imbedded in it for a ring. Make a small box six inches square and four or five inches deep to answer for a mold. Fill this with cement mortar made from one part cement to two parts sand, and push the horseshoe, heels down, into the soft mortar till only a semicircle large

enough to tie the rein in shows. Smooth the mortar on top and slip the trowel around the edges between the mortar and the sides of the form. Stationary weights



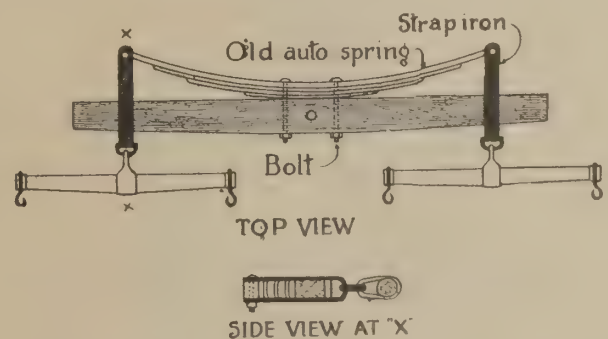
Concrete Hitching Block, Made of Poured Concrete with a Horseshoe Set Into It.

or hitching posts may be made in a similar manner, using old horseshoes for the staples.

* * *

Saves the Horses

HERE is an idea that is a great saver of horses, especially when they are inclined to plunge to start a heavy load.

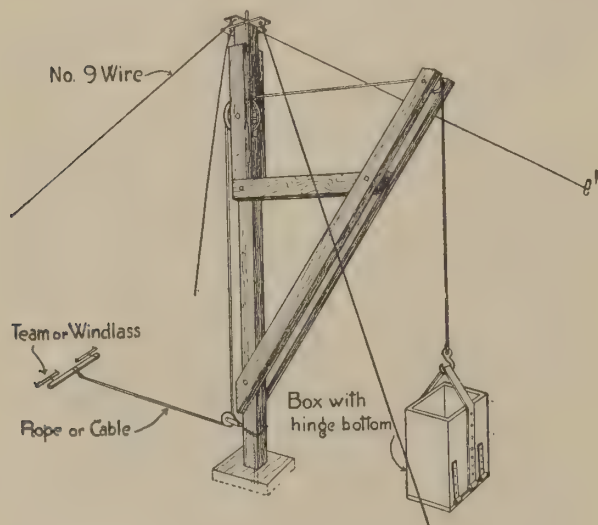


Old Auto Springs on Double Tree.

A leaf from an old automobile spring is bolted to the evener of a doubletree, as shown in the illustration. The singletrees are attached to this spring by a U-shaped piece of strap iron. When the horses start to pull there is enough to give to the spring so that the neck yokes are not brought so violently in contact with the breasts of the horses.

Hoist or Derrick

WHEN digging a well or a pit silo, or removing the ensilage from such a silo, the hoist or derrick shown in the accompanying drawing will more than save its cost in money and labor by the time it will save day by day. The derrick is made so that the boom and bucket may be swung around and the bucket dumped into a wagon or cart. This is accomplished by the means of a spindle at the top and a pivot at the bottom of the upright member of the derrick. The derrick is supported by four guy wires attached to the plate at the top, and holds it stationary while the derrick turns. Two heavy pieces of strap iron each having three holes in it, one at each end and a third in the center, are crossed at the top. The spindle runs thru the center hole, allow-



Derrick for Digging and Emptying Pit Silo or Other Lifting.

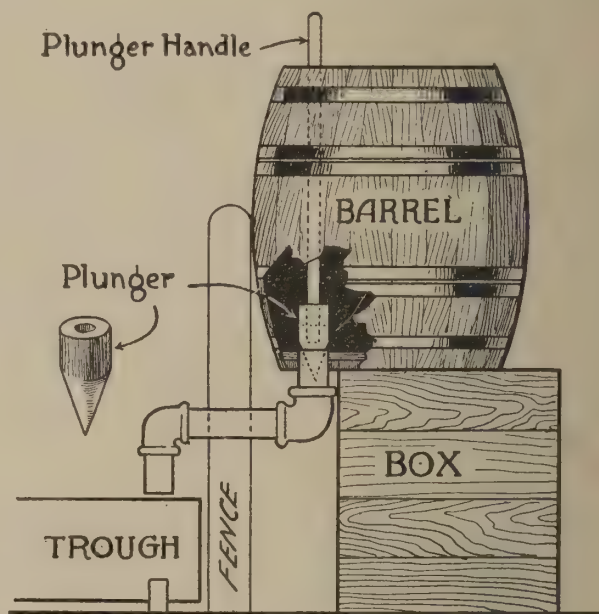
ing the derrick to turn, while the wires are attached to the end holes. The pivot spindle is set into a hole in a plank 2 inches thick and 12 inches square. The upright member of the derrick is 4 by 4 inches and 12 feet long. The plank is cut in two about 2 feet from the top and spliced with two pieces of 2 by 4. Into this opening is set the rudder wheel thru which the rope is passed. The boom is made up of two pieces of 2 by 6-inch

lumber, 9 feet long. These are bolted to each side of the upright member. The brace from the upright member to the boom is a piece of 2 by 6-inch lumber.

* * *

Hog Slop Storage Tank

ON a farm where there are many hogs to feed ideas that will save labor usually are appreciated. The storage tank for hog slop, shown in the accompanying illustration, has been used on



Storage for the Hog Slop That Saves Labor.

my farm with success for a number of years. Take an ordinary tight barrel and bore a 3-inch hole in the bottom at one side. Get two pieces of 3-inch pipe 6 inches long, one piece of 3-inch pipe 12 inches long and two 3-inch elbows and assemble them as shown in the illustration. Mount the barrel on a box 30 inches high, placed close to the fence so that the pipe may go thru into the hog feeding trough. Make a plunger out of soft wood and attach it to a broomstick. By means of this plunger the slop may be allowed to flow by gravity, or shut off. With this outfit a large number of hogs may be fed in a few minutes with very little trouble.

Handy Andy in the Chicken House

Chicken Feed Silo

IN dairying, silage has done wonders in keeping up the June flow of milk thru the winter. Then why not a silo, with its green food, for the chicken house, too? Isn't it probable that it will do as much for the egg yield?

An ordinary hogshead makes an excellent one and furnishes an easy way of storing odds and ends of green stuff, such as vegetable tops, lettuce, clover and grass clippings, which will help to keep the fowls producing and in condition in the winter.

The silo should be supported by planks raised about a foot above the ground, and standing far enough apart to permit ventilation. A hole is bored into the bottom of the hogshead to drain off excess liquid, and a small section is cut out near the bottom to permit removal of the contents. The portion cut out is then hinged in place and secured by a button, so that it serves as a little door.



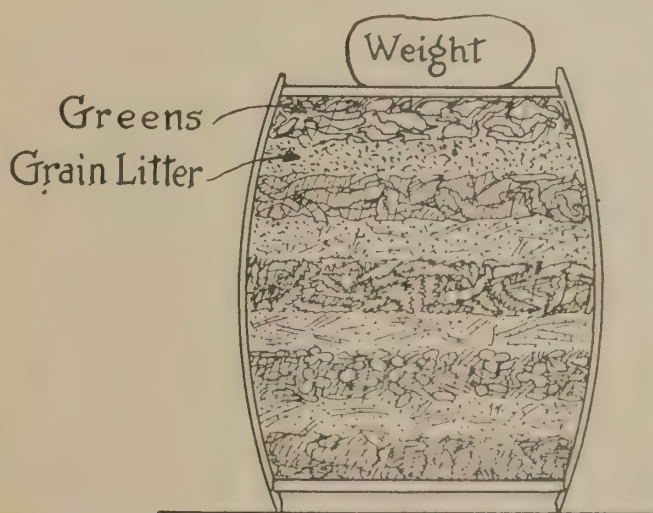
Silo for Preserving Fresh Feed for the Poultry Flock.

Enough material to fill the silo may be put in at one time, or added at intervals, as convenient. In filling, it is best to scatter layers of litter from the barn floor between the layers of green stuff, so that extra moisture will be absorbed. When the silo is filled, a cover of such size as will fit easily within it should be placed on top of the ensilage and weighted down by a stone.

* * *

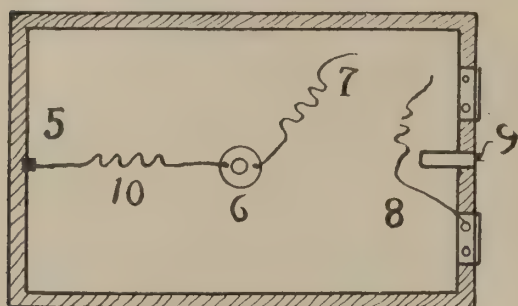
Electric Egg Tester

THE accompanying diagram shows an electric egg tester which is easily made with little expense. The materials required are about two feet of copper wire, a small electric light bulb and socket (6), a small straight spring (9), two small hinges (4), a small piece of felt or soft cloth, two dry cells and enough soft wood to make the framework of the tester.



Beet Tops, Celery Tops, Lettuce, Cabbage Leaves, Kale, Spinach, Clover and Grass may be used.

TOP VIEW of TESTER



TOP VIEW of COVER

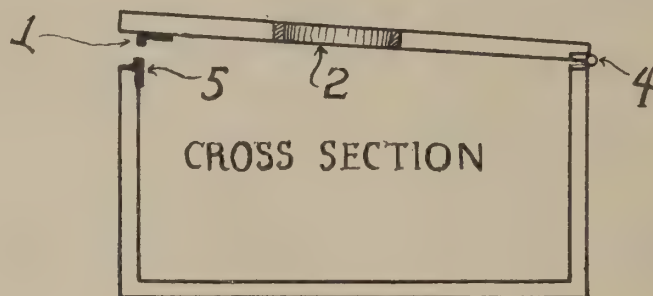
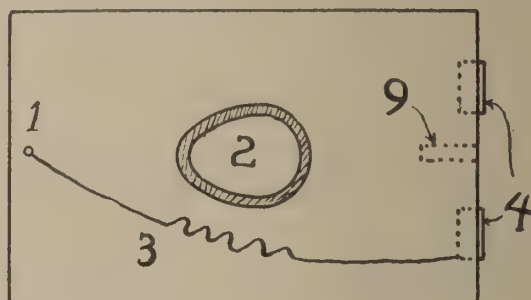


Diagram of Electric Egg Tester.

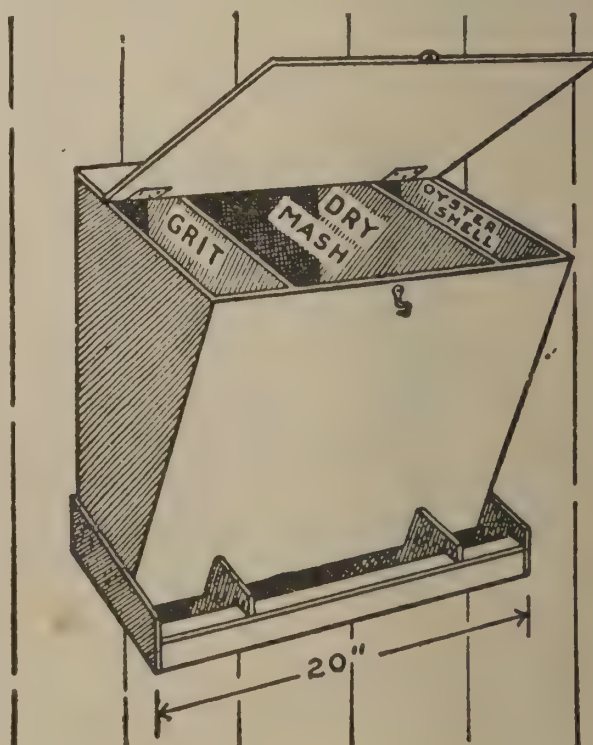
The tester should be 6 inches by 4 inches by 3 inches with the lid fastened by two hinges (4). In the lid, cut a hole the shape of an egg. This hole should be padded with the felt to avoid cracking the egg. (1) is a contact point on the under side of the lid and is connected to hinge (4) by wire (3). (5) is a contact point on the tester and is connected to socket (6) by wire (10). The wire (7) is a connection between the other binding post of the socket and the battery. The wire (7) leads from the battery to the hinge (4). In this way when the lid is closed the contact point (1) comes in contact with point (5), making circuit thru the bulb at (6), throwing light thru opening (2). The spring (9) keeps the contact points (1) and (5) a short distance apart but when an egg is placed over opening and a slight pressure applied, the circuit is made. The tester does away with the blinding light while candling eggs.

* * *

Dry-mash Hopper

THE dry-mash hopper is intended for use inside the laying house. It

should be hung against the wall about 8 or 10 inches from the floor, or as high as possible so long as the fowls can reach the mash. This prevents the mash from being thrown out and wasted. It may be made from boards taken from dry goods boxes or other thin material.



Dry-Mash Hopper for Use in the Laying House.

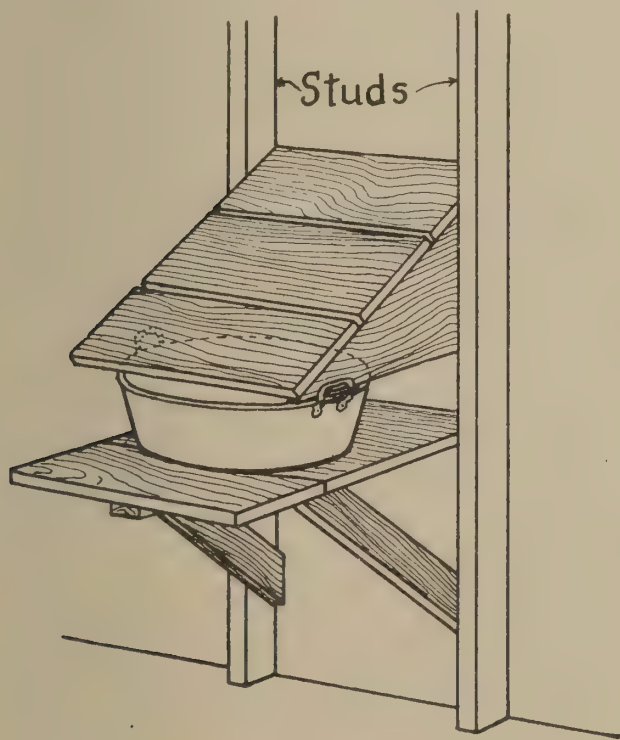
There are three compartments—one for grit, one for shell, and one for dry-mash. The projections from the partitions are to prevent the fowls from mixing the dry-mash with the grit and shell, as well as from wasting it. The feeding of dry-mash is a better practice than feeding wet or moist mash, as it requires less work and the hens can regulate their feed to suit their needs.

* * *

Protected Water Supply in Chicken House

THE illustration shows how I keep my hens from jumping into their drinking vessels.

I first make a platform, as shown,



Cover for the Water Basin in the Chicken House that Keeps the Water Clean.

about one and one-half feet above the floor, on which I place the pan, which is a dish pan. This platform is made between two studs. Next take a square board of required dimensions and cut it from corner to corner as shown. Nail the two pieces to the studs so the slant edge is on the top and just high enough

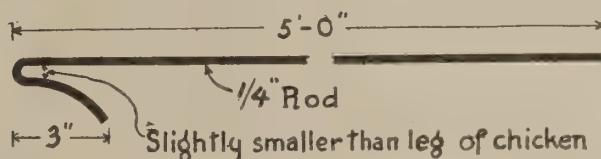
to clear the top of the pan. On these pieces nail a few light boards so as to close the top as shown. The cover should extend just far enough from the wall so as to leave an opening of about two inches at the edge of the pan for the chickens to drink thru.

* * *

Catch Chickens With A Hook

IF CHICKENS are caught with an ordinary piece of quarter-inch wire bent into the form of a hook at one end they will not be scared. Chasing and cornering one fowl stirs up the entire flock needlessly.

The rod is bent as shown in the diagram with the hook at the end slightly smaller than the leg of a chicken. This hook is then brought near the chicken's leg and hooked around it. The harder the fowl tries to get away the harder the hook wedges the leg, but the round



How to Catch Chickens.

wire does no harm and the chicken is easily pulled up to be caught with the hands.

With this simple hook there is no need to wait until evening to catch a croupy fowl or to cull out a rooster or to procure the next day's dinner.

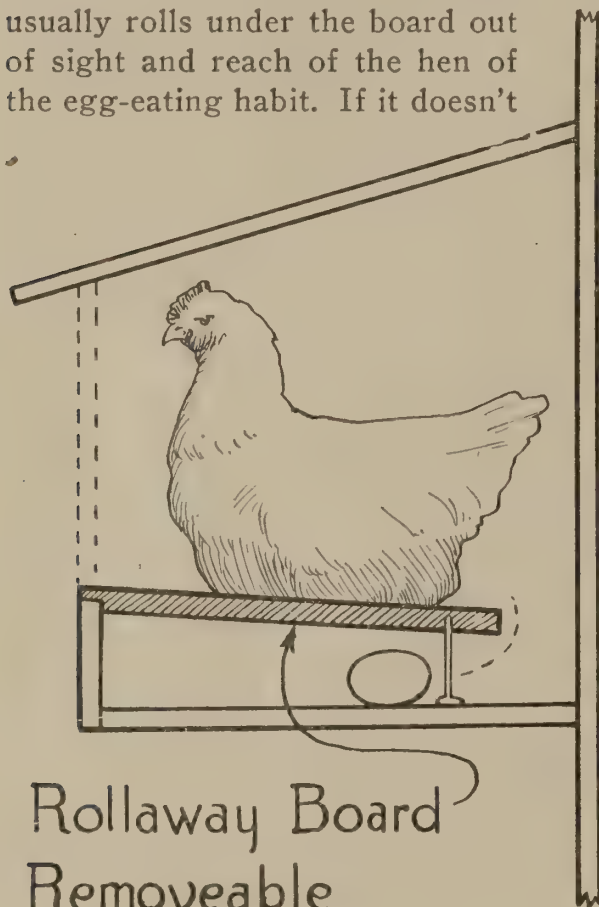
* * *

A Good Trap Nest

HERE is a simple device which an Iowa farmer has installed in his hen house to stop hens from eating their eggs, an evil that is apt to break out in the "best-regulated" poultry yard.

It is merely a board made to fit loosely in the hens' nests with nails on

the lower side acting as little legs to hold it off the floor of the nest a couple of inches. The hens sit on the board instead of on the floor of the nest in laying their eggs. The board is a little shorter than the depth of the nest. The egg when it is laid rolls back over the board and drops down to the floor. It usually rolls under the board out of sight and reach of the hen of the egg-eating habit. If it doesn't



Trap Nest for Hens That Are Inclined to Eat Their Eggs. The egg rolls off the board and underneath where the hen has not sense enough to look for it.

and the hen attempts to crack the shell, at the first peck the egg slips out of her reach under the board.

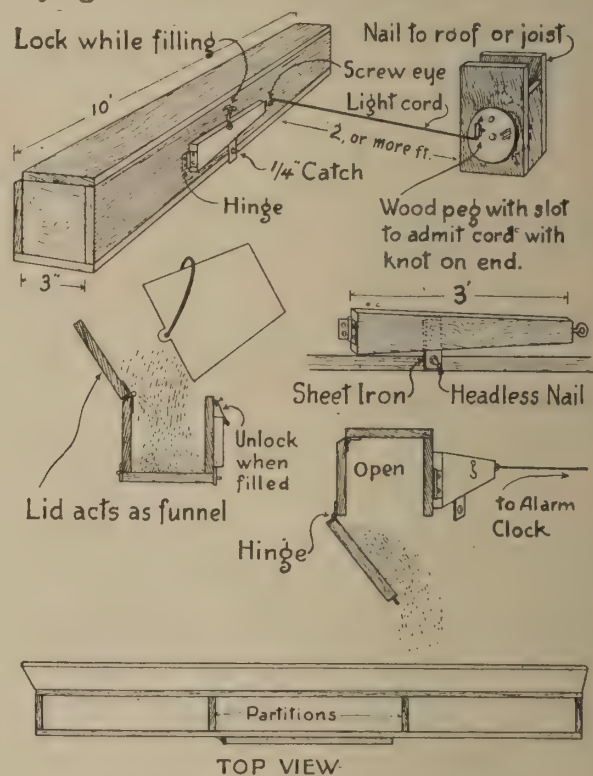
This nest has been found a guarantee against loss of eggs thru the medium of the egg-eating hen.

* * *

Automatic Feeder for Chicken House

AS I live alone and still keep a flock of chickens, it became necessary for me to devise a method of feeding them

during my absences. Hence the automatic feeder shown in the accompanying illustration. As will be seen the feeder consists of a box for holding the feed, and a device which is operated by an alarm clock to open the box at any given time. The feed box is 10



Automatic Chicken Feeder.

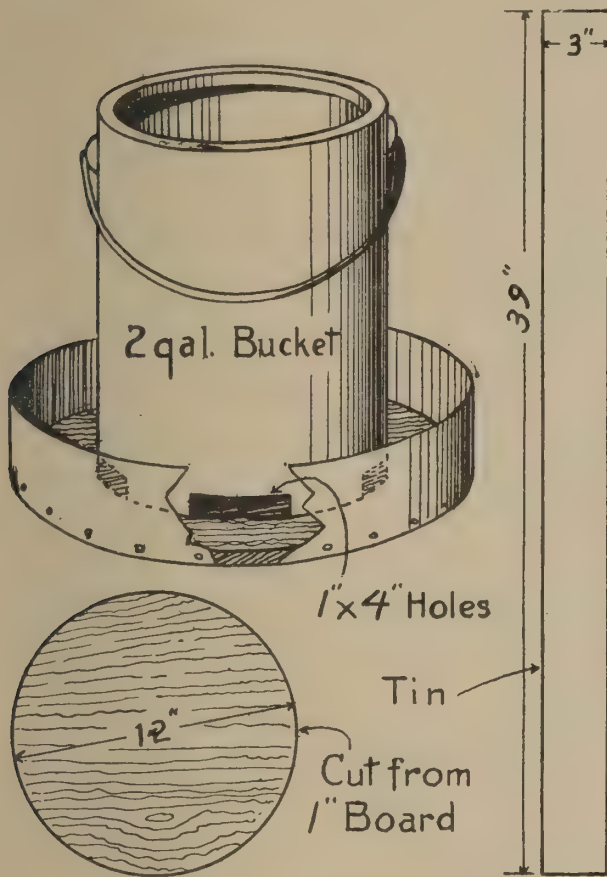
inches long and 3 inches wide and high. There is an opening on one side that is closed by a hinged piece. Attached to one end of this piece is a cord, the other end of which is attached to a peg that fits into the key of the alarm of the clock. The clock is set to operate at a certain time. The turn of the key winds up and shortens the string, pulling open the feed box. The box is fastened to the joists of the chicken house, so that the feed will leave the box by gravity. Details of the construction of this automatic feeding device are shown in the drawings.

* * *

Chicken Grit Feeder

THE feeder shown in the illustration makes feeding chicken grit or any other dry feed easy. Just pour the feed

in at the top and it will feed automatically.



Chicken Grit Feeder That Is Simple to Make.

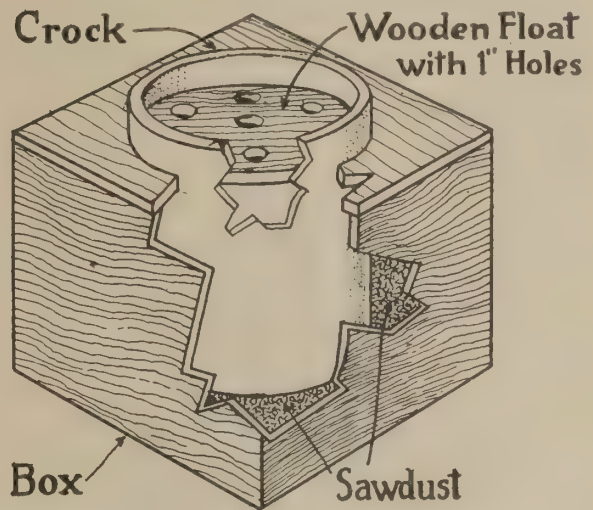
As the sketch shows the feeder consists of a round board 12 inches in diameter, as shown, a strip of tin 39 inches long, 3 inches wide, nailed around the board, and a two-gallon bucket, in which holes are cut. They are 4 inches long and 1 inch in height around the bucket. The bucket is then nailed in the center of the round board and the chickens can get all around it and feed themselves.

* * *

Poultry Fountain that Does Not Freeze

A POULTRY fountain that will not freeze in winter, keeps the water clean and cool is very useful in the poultry house or yard. The fountain shown in the illustration is made by taking a glass or earthenware crock and setting it in a box with 2 or 3 inches of sawdust

or shavings packed around it. In the jar or crock is a wood float that has several 1-inch holes bored in it and which has been shellacked to make it



Insulated Box Prevents Water from Freezing.

waterproof. The float rises and falls with the water and is buoyant enough to support the chickens, whose weight brings the water to the surface of the holes.

* * *

Barrel Chicken Coop

A SERVICEABLE brood coop is made by sawing a barrel of any kind in two in the middle, making the



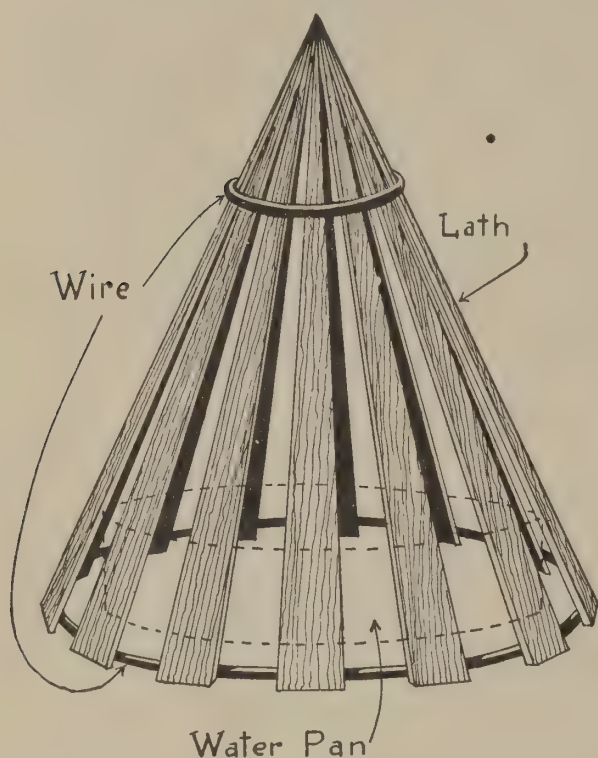
Barrel Converted Into a Portable Chicken Coop.

cut sloping, as shown in the illustration. When an entrance hole has been sawed out on one side of each half, two coops will be completed. When the half barrel is inverted, the top will slope sufficiently to turn water. If one head should be missing, a cover of boards may be provided.

Sanitary Water Fountain for Chicken

HERE is a sanitary water fountain which a farmer uses to keep the chickens out of their drinking water. It is simple and easy to make.

To make one of these fountains take



Method of Keeping the Chickens Out of the Water Pan.

six laths three feet long. Cut each one in two and you will have 12 pieces 18 inches long. Make a hoop out of No. 12 wire, two inches larger in diameter than the drinking pan. Then staple the slats equal distance apart on the inside of the hoop. Then make another hoop 4 inches across out of No. 12 wire. Slip it down over the top as far as necessary and your fountain will be made.

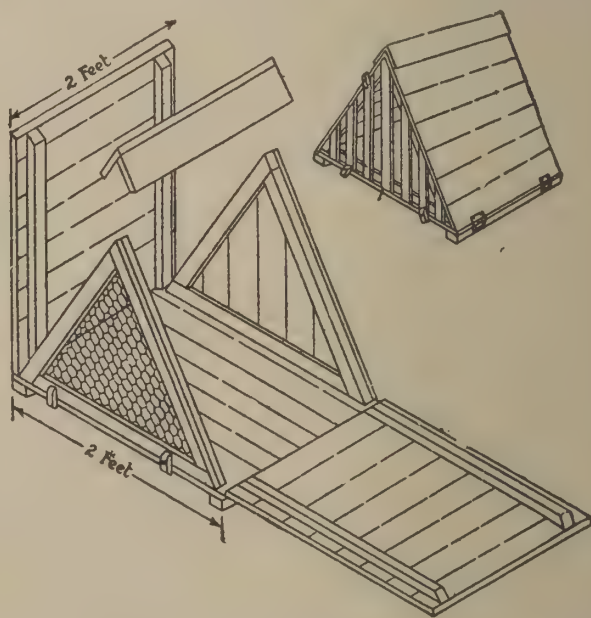
* * *

Brood Coops for Hen and Chicks

EVERY boy and girl who raises chickens should provide a good coop for the mother hen and little chicks. If you do not have one already, it should be built before it is time for the little

chicks to hatch. Many boys and girls build their coops in the winter time so as to have them ready for use in the spring, and when this is done a nest box can be placed in the coop and used for the sitting hen. A properly constructed coop is a good place for hatching chickens as well as for brooding them. When chickens are hatched in the brood coop, however, the nest should be removed and the coop thoroly cleaned and disinfected before putting the hen in with chickens.

The two brood coops shown in the illustration can be made easily. The "A" shaped coop is collapsible so that it can be easily cleaned or stored away in winter. Or if desirable, it may be built stationary by simply nailing fast the top, back and slats in front and placing it on a removable bottom. A wire-screen door, one-inch mesh or smaller, of some sort should be provided, as shown in the illustration of the collap-



"A"-Shaped Wood Coop for Hen and Chickens.

sible coop, to place over the front at night. This will prevent rats and other enemies from entering the coop and killing the chickens and will also keep the little chicks confined early in the morning, when the grass is wet. A hook or clasp should be put on the door to hold it firmly in place.

The mother hen should be confined to the brood coop until the chicks are weaned. This will give the little chicks a better start in life and prevent loss from storms, hawks, etc.

Floors should be constructed for the brood coops to rest on. This keeps the chickens dry, and if kept clean and well disinfected it will prevent losses from disease. It is a good plan to keep some dry sand or chaff on the floor under the coop. This helps to keep the coop dry and makes cleaning easy.

To make brood coops rainproof, cover all the cracks on the top, back and sides with strips of wood or tin, or, better still, cover with roofing paper. Construct the brood coop so well that it can be used year after year.

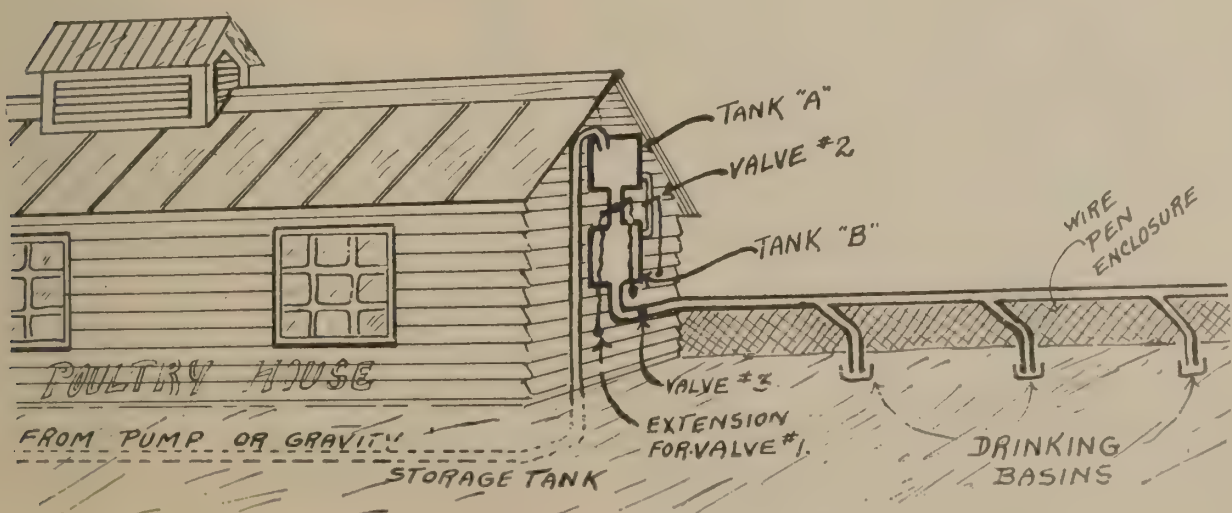
* * *

Water for Poultry Yards

AN important maxim of successful poultry breeders is that poultry should have water at all times and that the drinking fountains should be cleaned out daily. By the simple arrangement shown in the accompanying sketch it is possible to do this with the minimum of labor and time. The drinking basins work on the principle of the small atmospheric pressure poultry water fountains that

are sold in almost every supply house. The cycle of operation of the system shown by the sketch is as follows:

Assume that all valves except No. 3 are closed. As the water in the basins evaporates or is consumed water from tank "B" feeds into the basins until the ends of the supply pipes dipping into the basins are submerged a fraction of an inch. The feed of water then stops automatically, and, as long as there is water in tank "B" the basins will always remain filled. Raising or lowering the basins will determine the amount of water in the basins. If it is desired to feed a small but steady stream to the basins constantly valve No. 2 must be opened. This feed may be regulated to supply a few drops to about a pint an hour. By opening valve No. 1, connecting tanks "A" and "B," a sudden body of water will flow into the basins with enough force to thoroly flush and clean out all accumulated dirt. Allowing this valve to remain open only two seconds will do work that ordinarily requires an hour or more on the average farm. Valve No. 3 is placed in the system to save water when tank "B" is to be re-filled from tank "A." Tank "A" receives its supply of water from the farm pumping system or from the gravity water storage tank. In the case where



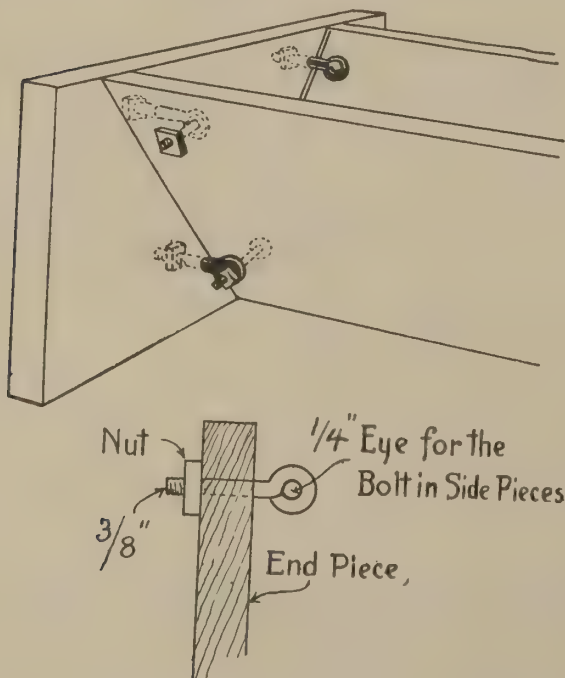
Gravity Water System for the Poultry Yard.

a storage tank (gravity supply) system is available tank "A" may be eliminated by connecting the piping from the storage system directly to valve No. 1. This does not change the operation of the system. The tanks shown in this case are 31 gallon wooden oil barrels, but other tanks may be used, such as old hot water storage tanks that have served their term of usefulness.

* * *

Hogs Feed Trough

FARMER friends who make their own pig troughs and have trouble keeping the end pieces on will find the following a pretty good plan. Make your trough as usual. Then take and bore a $\frac{3}{8}$ -inch hole thru the end piece near the top, just missing the inside. Put one near the bottom, just missing the outside, using three or four on a "V" shape trough—as you see fit. Then have some "I" bolts about 4 to $4\frac{1}{2}$ inches long, placing the bolt thru the end piece, letting the threads stick out on the out-



Showing How Trough Is Constructed.

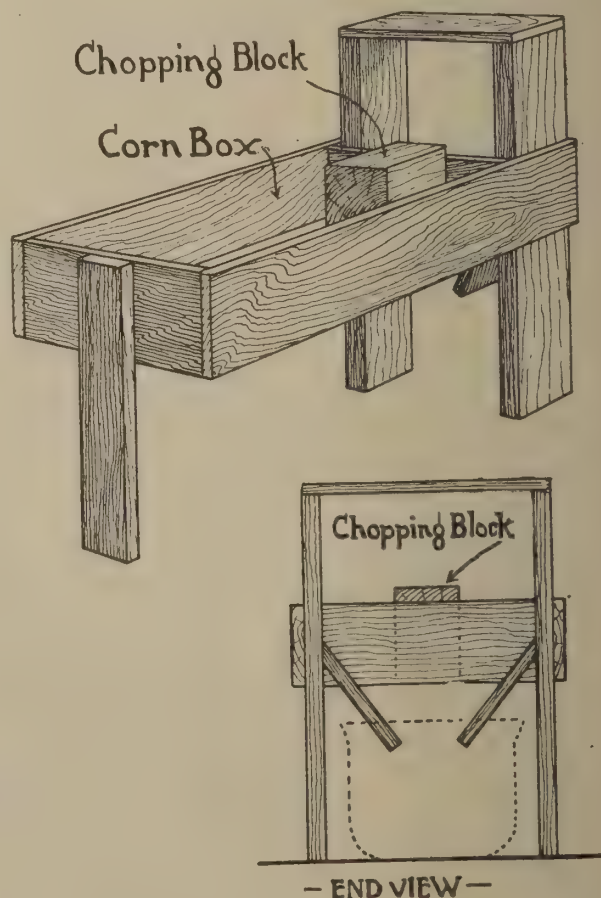
side. Bore $\frac{1}{4}$ -inch hole about 2 inches back from the end and place $\frac{1}{4}$ -inch bolt thru it. Tighten the nut on the end

piece, and you will have a trough the ends of which will stay with you as long as there is any trough left.

* * *

Corn Chopping Block

HAVING had occasion to chop considerable ear corn for cattle, I devised and built the corn chopping block shown in the accompanying illustration. As will be seen it is a box, built of strong lumber and set on three supporting members, or legs. The block is set at one end, so that the chopped corn will fall, or may be brushed off into a basket, two diagonal pieces of board acting as guides. The ear corn is put into the box, where it is at hand, while the chutes carry the kernels that are knocked off the cobs into the basket that sits below.



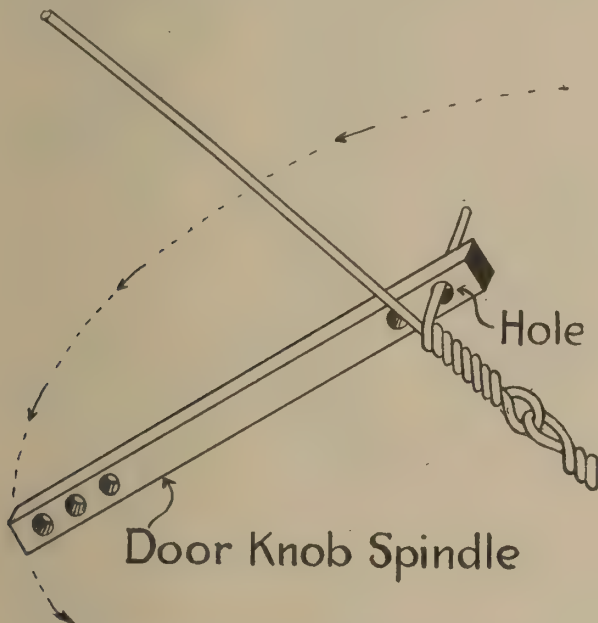
Chopping Block for Ear Corn.

This will be found a great labor and time-saver in chopping corn.

Handy Andy in the Field

Fence Wire Splicer

I ENJOY making the things described and illustrated in the Handy Andy Department of *Farm Mechanics Magazine* and never miss reading and studying them. Here is an easy way to make a wire splicer. Take the shank out of a door latch and remove the knobs. This



Door Latch Spindle Makes Good Wire Splicer.

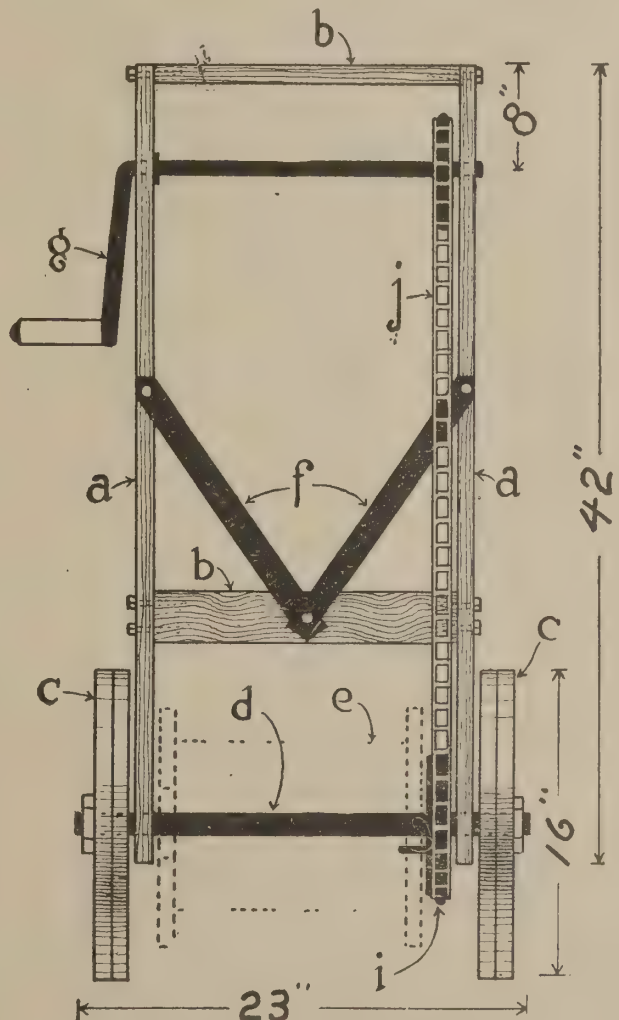
leaves a rod about six inches long. Cross the wires where they are to be spliced and hold with a pair of pliers. Then insert the ends of the wires in the holes in the splicer and twist.

* * *

Barbed Wire Reel

THE accompanying sketch shows a barbed wire reel that we have used and have found that it enables one man to do the work of two and do it better. The same reel that comes with the wire is used. With this reel the wire can be rolled either tightly or loosely, as desired, as fast as a man can walk. Referring to the sketch: Pieces "A" are 42 inches long, 1 inch thick, 3 inches wide, and are spaced 16 inches apart.

Pieces "B" are 1 by 3-inch cleats, bolted to "AA" at the top. Parts "C" are wheels, 16 inches in diameter and 2 inches wide, made of 1-inch boards. The axle holes are $1\frac{1}{4}$ inches in diameter. Part "D" is 1-inch pipe threaded at both ends and having lock nuts for heads. The axle "D" passes thru the lower ends of "AA" and serve as a journal on which the reel turns. "E" is the regular barbed or smooth wire reel, either of wood or wire. "F" is the flat iron brace,



Reel for Barbed Wire.

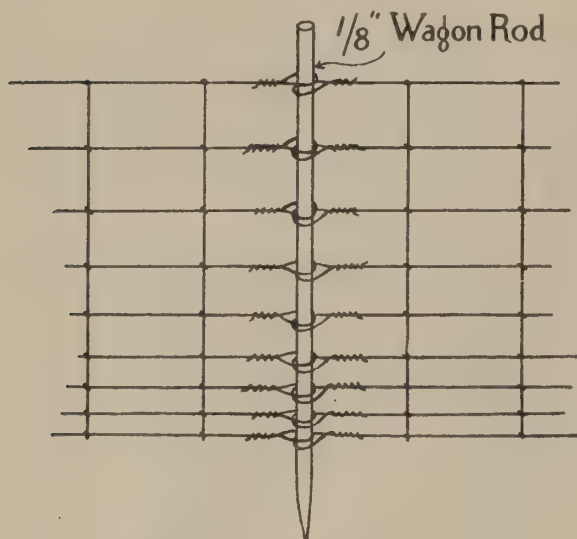
attached as shown in the drawing. "G" is the crank shaft carrying sprocket "H" at the upper end of "A." "I" is the reel sprocket, and carries a pin drilled in the hub, which projects to engage the reel to drive it. "J" is the chain to fit the sprockets. The operator pushes the de-

vice along, turning the crank and winding the wire as rapidly or slowly as desired.

* * *

Wire Fence Fastening

A DEVICE for fastening two strips of woven wire fencing together is shown in the illustration. When using



Rod That Fastens Wire Fence Together.

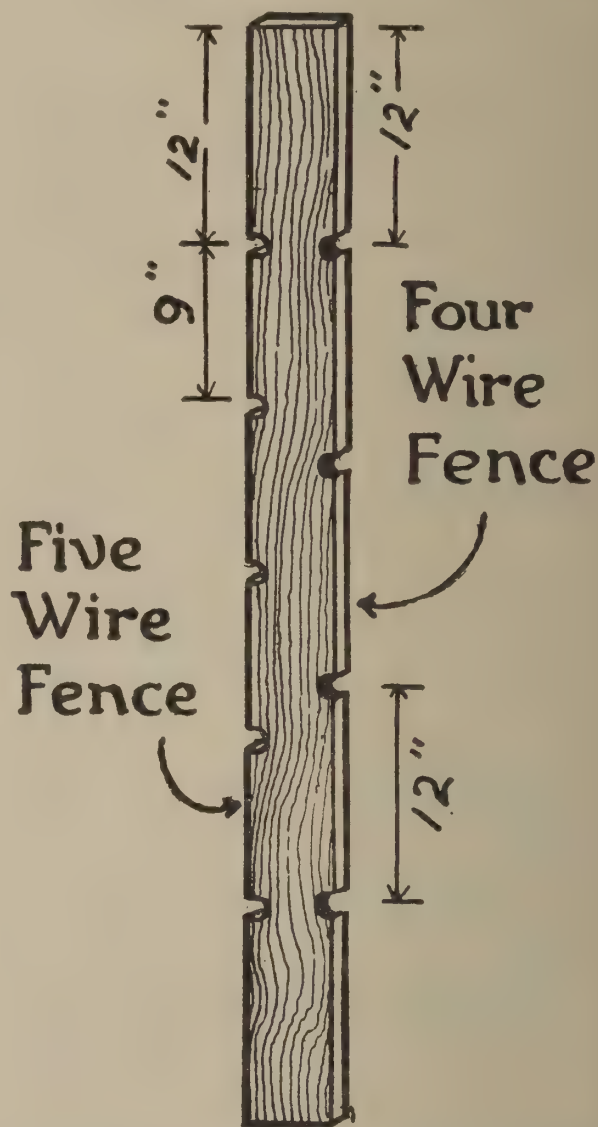
the fencing for hogs in the fall when they are in the corn, it is easy to fasten and unfasten. When the wire is stretched, the tension holds the rod in place. I find this very efficient.

* * *

Handy Method of Marking Posts

WHEN putting up a new barb wire fence much time can be saved by having the posts marked before beginning to put the wire on. It is not necessary to do any sighting to get all the wires the same distance apart and the wires are always the same height from the ground as they follow the natural variations of the ground. A simple yet handy marker can be made by taking a piece of wood about 3 inches wide and 5 feet long and cutting notches on either side of this at the place the post should be marked for the wire. On one

side make the notches 1 foot apart and begin 1 foot from the top, this is for a four-wire fence. In the other side make



Guide for Marking Posts When Stringing Wire Fence.

the notches 9 inches apart, making five notches for a five-wire fence. This leaves about a foot from the ground to the last wire.

* * *

For Pulling Fence Posts

HERE is a device we use to pull fence posts and it has proved a time and temper saver. As shown in the illustration, it is made of 2 by 4 planks, bolted securely together and braced. To operate, the device is placed against the post. A chain is passed around the post at the ground line and run over the

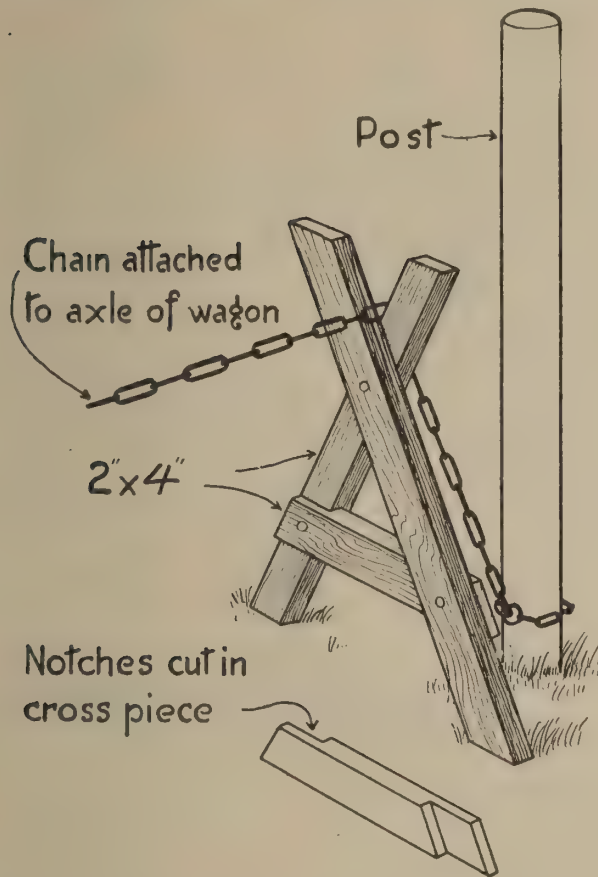
crossed pieces as shown in the drawing. A team or tractor is attached to the other end of the chain and the post pulled. By using this device the chain

catch it in the other notch. This tightens the rope over hay, fodder or anything that can be bound on a wagon, instead of using a long stick.

* * *

To Anchor Fence Corner

A GOOD method to anchor a fence corner is to dig a hole 2 feet in diameter, 3 or more feet deep. Two holes are bored in the butt of the post about 4 or 5 inches from the bottom.



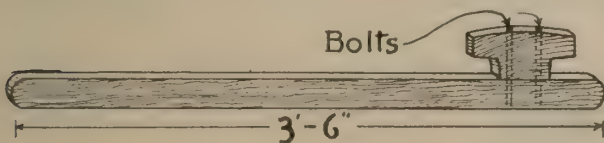
To Lift the Fence Posts with Tractor or Team.

makes the pull up. With one man to attach the chain and set the puller and another to drive the team and load the posts, the work progresses rapidly.

* * *

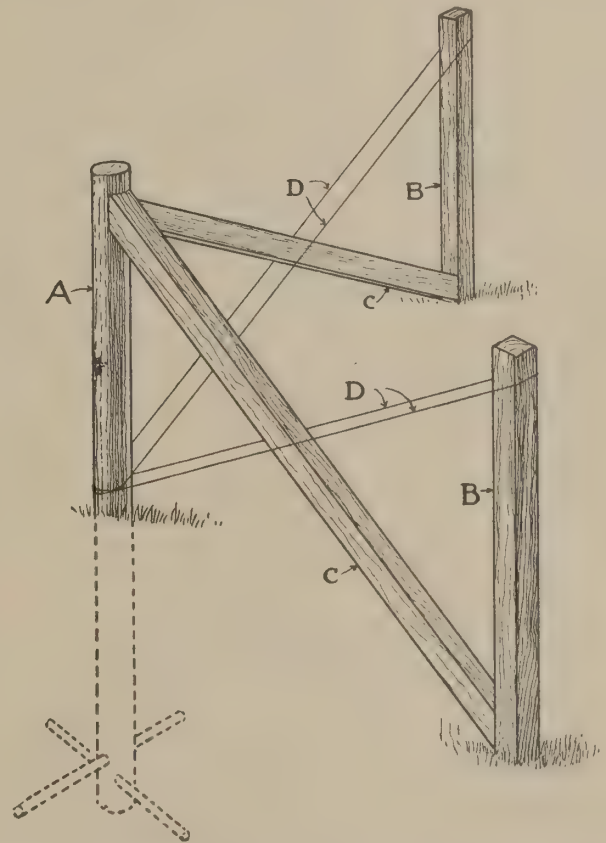
Binding Stick

I AM giving you a description of a binding stick, which is about 3½ feet long, with an extra piece with notches as shown in illustration, which is bolted



To Tighten Up the Ropes or Chain Around a Wagon Load.

on. The way to use it is to catch the rope in one of the notches, twist and



Showing How Corner Fence Post Is Anchored.

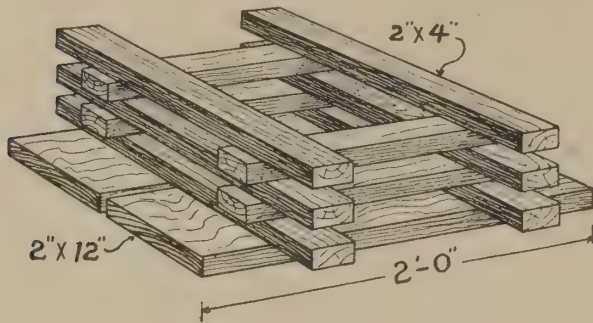
In these holes are inserted iron rods in the shape of a cross. The post is put in the hole, which is filled with dirt up to the rods and well tamped. Then fill with rocks and dirt, tamping it well. The posts should be wired tightly together. This corner will not pull out and makes a neat looking job.

* * *

A Salt Box

FOR a block of salt take two 2x12s, two feet long. Lay them on the

ground side by side about $\frac{1}{2}$ -inch apart so the rain will run thru. Then set a block of salt on them and spike a 2x4 on each side of the block. Clinch the spikes.



Box to Hold Block Salt Made of 2 by 4s.

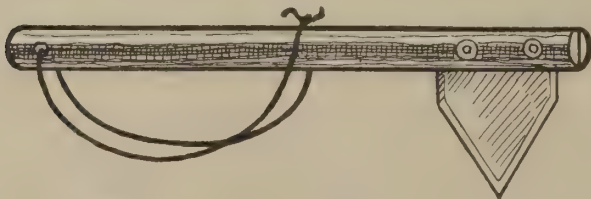
Then cross two 2x4s on top of the first 2x4, only on the other side of block of salt until you get as high as you want to build. Lay the 2x4 the flat way. Let the ends stick by salt so they won't split when spiked. This can't tip over and will make the salt last as long again. It saves the farmers many dollars a year, and it won't break. Don't build too tight to the salt, for if you do the next block won't go in.

* * *

Handy Band Cutter

A BAND cutter is a time-saver around a corn shredder or where husked corn is being fed to the cattle.

The sketch shows a band cutter made by sawing a slot lengthways thru a piece of broom handle (about 7 inches in length) making the slot long enough to



Home-Made Band Cutter Made of Mower Tooth.

let an old mower or binder section slip in.

Next make holes in the handle to rivet thru and rivet the section in the slot.

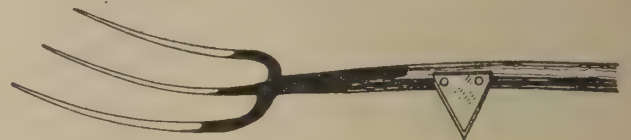
Make a hole in the other end and insert a string and tie ends to hang it up by, when not in use, also to loop around wrist.

* * *

Useful for Cutting Bands

I HAVE found this device very handy for cutting bands, especially when labor is high and scarce. The man who is pitching bundles to a corn shredder or silo filler can cut the bands very easily and thereby save the aid of one man to cut bands. Also when pitching wheat bundles to grain separators not having a self feeder with lots of dirt or filled with smut or rust or briars, it can be used very successfully.

To make the band cutter I attach a



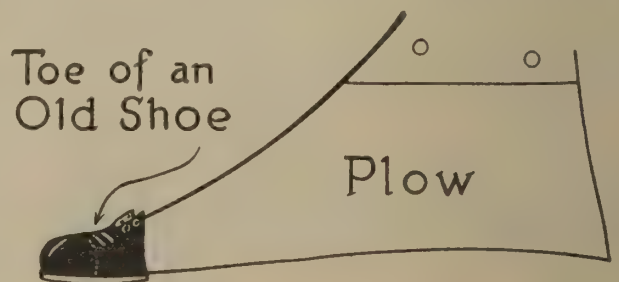
Handy Band Cutter on the Pitch Fork.

mower sickle section close to the bottom of the handle as in the illustration. Use small bolts or rivets to attach section, and keep section sharp.

* * *

To Keep Plow Out of Ground

WHEN going from one field to another, if you will take the toe of an old shoe and place it over the plow

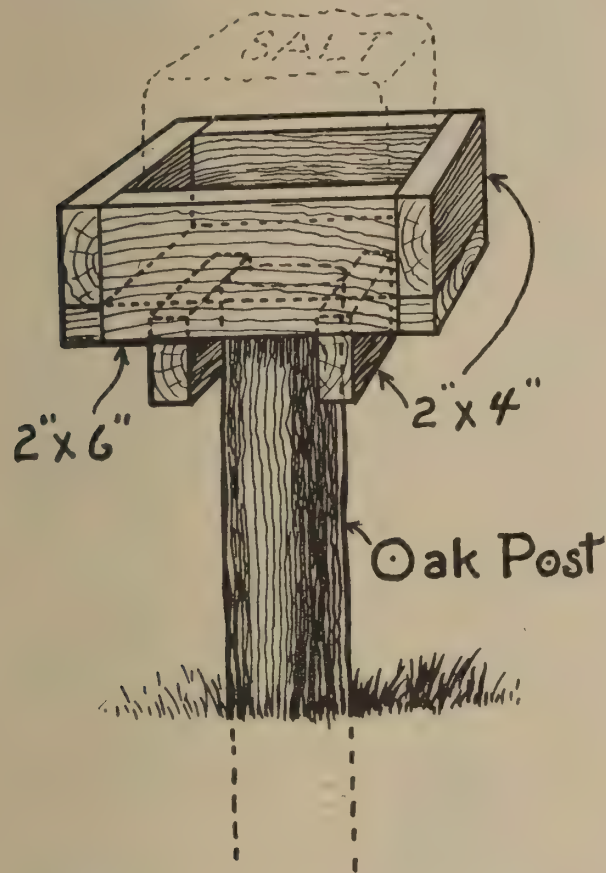


Toe of Shoe Slipped Over Plow Point.

point as shown in cut, it will eliminate a great deal of work.

Good Salt Box

TO make a good box to keep salt clean in the cattle yard, take a 10-inch plank about $12\frac{1}{2}$ -inches long for the bottom, which should be 9 or $9\frac{1}{4}$



Salt Box for the Pasture Lot.

clear inside. Nail two 2 by 6s, $9\frac{1}{4}$ inches long, one on each long edge of bottom; set them back equal distance from ends. Nail on the 2 by 4s across ends of 2 by 6s, giving a chance to nail bottom to edges of 2 by 4s.

Dig down quite deep and set a solid post sawed square on top leaving about two feet above the ground. Spike the bottom of box to post. It is also well to nail two pieces to post, underneath and across bottom. A hole in each corner will let out rain water.

As the cattle will use the post for rubbing against, it needs to be solid.

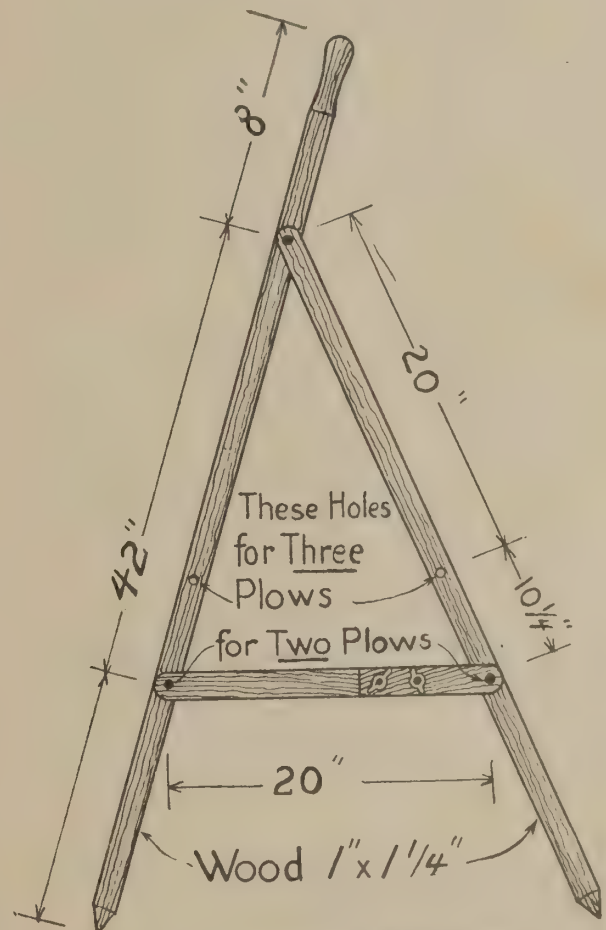
* * *

Adjustable Plowing Measure

THIS contrivance is of great use in marking out the lands before plow-

ing. The one shown here may be set to either two or three fourteen-inch plows. The wood used should not be too heavy and the handle shaped to suit the hand. The cross arm should have two bolts with wing nuts for easy adjusting. I might say that if this device were used when setting the posts to fence in a field so that every second or third post was a mark for an opening furrow, it would save considerable time.

If you stepped off 32 trips with the



Detail of Cross Arm

Construction of Plowing Measure.

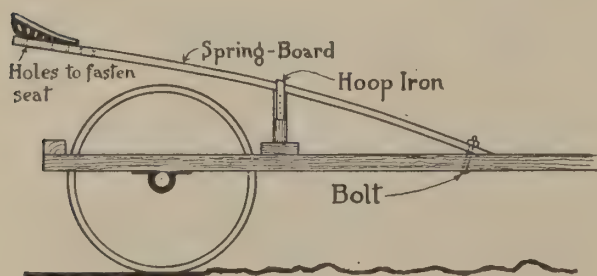
measures set for three plows you would have a land of about 112 feet. This would give you about one-third of a mile idle travel on the headlands to plow out each land. A smaller land would of course give you less. It is also said that in plowing an acre a tractor pulling one fourteen inch plow travels about seven miles.

Eliminates Jolts of Roller

I RECENTLY saw described a method of mounting the seat on a land roller so as to have the weight of the driver balance the weight of the pole, and thus relieve the weight on the horses' necks. The accompanying sketch shows another way in which this same result can easily be accomplished, and, better still, this plan relieves the driver of the jolts which a rigid seat will transmit to his body.

The plan is quite simple and inexpensive. All that is needed is a springy piece of oak, ash, or some other kind of board which will spring under the weight of the driver when the board is supported at the middle and the driver sits on one end. One end of this board should be tapered down to five, or six inches, and bolted to the pole a few feet in front of the double-tree. The length and position of the board will depend largely upon the size of the roller and the method of its construction. In some cases it will have to be several feet long, and perhaps an inch and a half thick.

On the roller frame, just back of the double-trees, spike a block of wood on which this spring-board can rest, and fasten the board to this block by a piece of hook iron, a heavy piece of leather



Seat for the Roller.

or some other material passed around the board and nailed to each side of the block. Do not nail thru the board, as this will weaken it at the point where it has to stand the greatest strain.

Have the board extend far enough

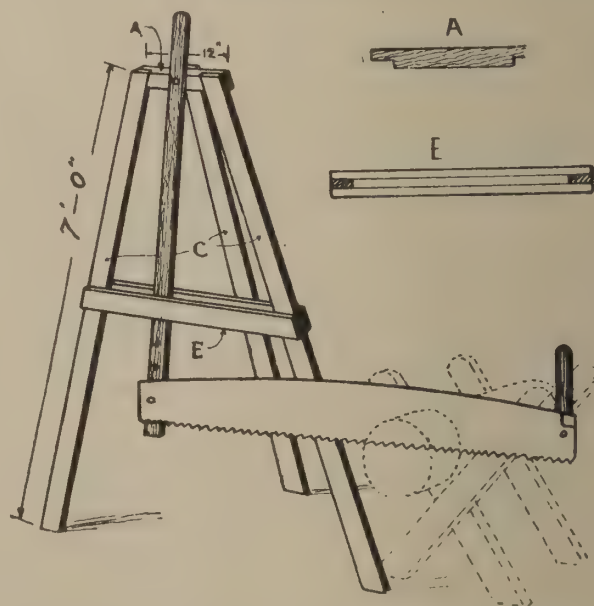
behind the roller to permit the weight of the driver to balance the pole. Several holes may be bored, with which to fasten a metal seat, or the board itself may be used as a seat, cushioning it with anything which may be convenient.

After once trying this spring board, no man will want to go back to a rigid seat.

* * *

One-Man Crosscut Saw

HERE is an excellent plan of a one-man saw. Build this in form of a derrick, as shown in cut. Take three pieces 1x2, seven feet long (c), countersink two of them on one side of (A) so that the saw pendulum, when bolted to (A) can swing freely. Then take the other piece, and nail onto the opposite side of (A) and this will form a substantial derrick. The pendulum should slide along in a groove, as shown



Tripod Standard for One-Man Saw.

in (E), nailed on side of derrick. This will steady the pendulum so when the saw is bolted on it will pull straight.

Then take one handle off of a crosscut saw, and bolt onto the bottom of pendulum. You will be surprised at the wood that can be cut by one man with an outfit of this kind, providing the man is of the right build.

Making the Seat Ride Easy

TO make the seat on your mowing machine or binder ride more easily and comfortably, cut a piece of leather or



Leather or Canvas Covering for Seat of Riding Implement.

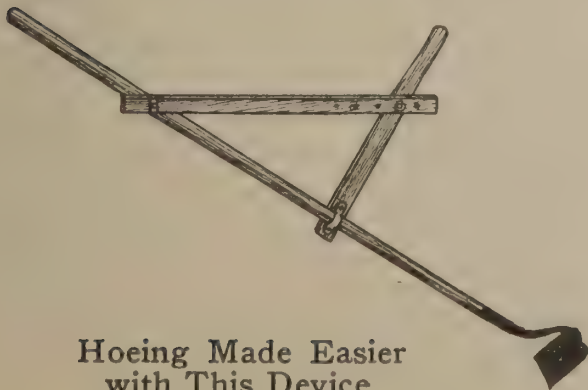
heavy canvas as shown in the illustration. Sew or lace this to the seat around the outer edge. The seat will be much more comfortable than an iron seat on a hot day.

* * *

Prevents a Backache

ANYONE who has hoed corn or cotton for days at a time knows what painful sensations the continual stooping causes in one's back muscles. Even the using of hoe or rake in the garden often becomes very tiresome. The sketch shows a simple contrivance, that, secured to handle of hoe or rake, takes all the backache out of hoeing or raking. Simply get two sticks, fasten one end of each to hoe handle with small clamp, let one end of horizontal piece be bored with several holes in which a peg or bolt in upright piece will fit, then round up and smooth the upper end of upright piece to make a good hand-hold.

The holes in the horizontal piece will



Hoeing Made Easier with This Device.

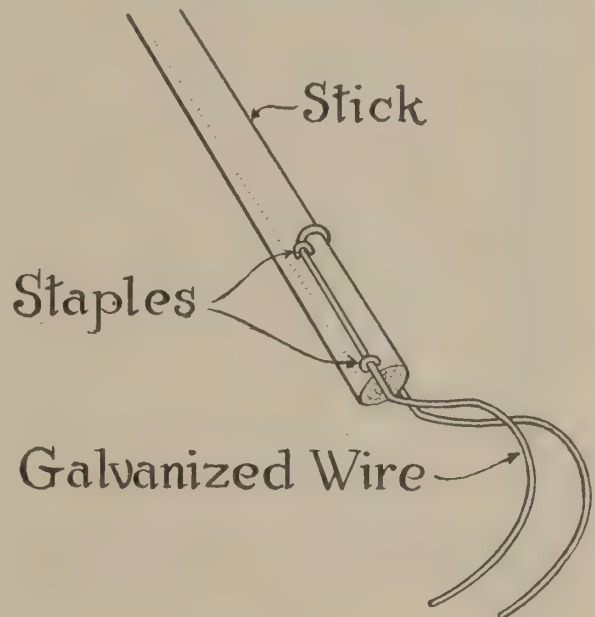
allow it to be adjusted to the use of any size of person, and the painful stooping is a thing of the past, for you can stand perfectly upright and do your work just as well. Make the pieces of pine, so they will be light as possible and still be strong enough.

In case you wish to use the hoe or rake without the adjustment it can be detached in a second or two. This little device will save much hard labor, and at a cost of practically nothing.

* * *

Corn Uncoverer

MOST farmers carry on the frame of the cultivator a stick with nails in the end to pull the dirt off the corn



For Uncovering the Young Corn After Cultivating.

when the cultivator covers them up. These sticks are a nuisance, I have found by experience. They slide off the frame and it is necessary to stop and pick them up. Besides, the nails often catch in the corn and either break it off or pull up the plants.

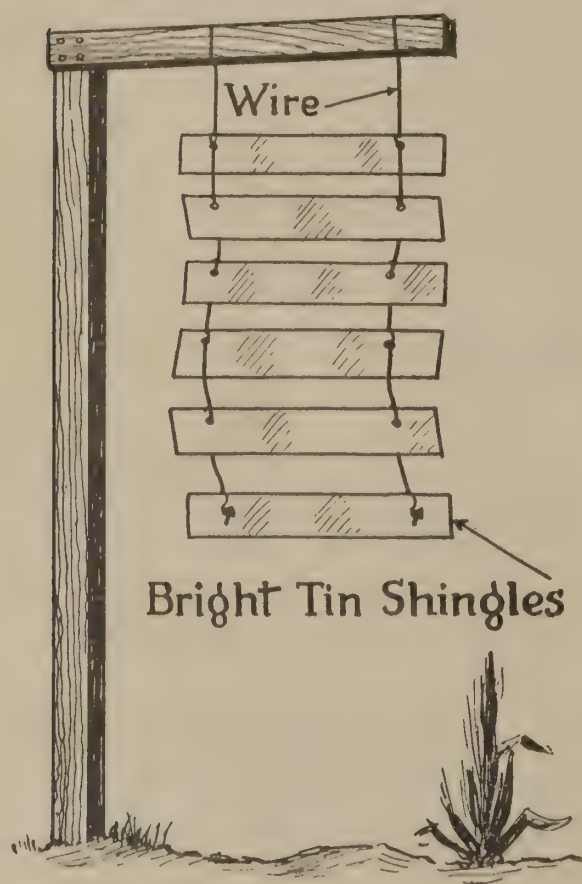
About four years ago I devised the corn uncoverer shown in the accompanying illustration. I have used it every year and have found it far superior to the old tool. A broom handle is good for the shaft, but a square stick is better,

as it stays on the cultivator frame. The hooks are made of No 8 or No. 9 galvanized wire, stapled to the handle and bent in the shape shown. One can usually pull the dirt off the hill from the cultivator seat, and oftentimes can find a "lost" hill and not tear the corn when it is found.

* * *

A Simple Scarecrow

FARMERS use many methods to scare crows from the fields. I have seen scarecrows of various kinds, but have found that the simple one shown in the



A Scarecrow Made of Bright Metal Shingles.

accompanying illustration is the most efficient. It consists of an ordinary 2 by 2 post, an arm of 1 by 2 lumber from which are suspended with wire a number of bright tin shingles or other metal objects. When the sun is shining or the wind blowing the glitter or rattle from an object of this sort will do much more

to keep the crows away than the effigy of a person. A thin coat of clear varnish will keep the tin shingles from rusting, but will not dim the glitter of the metal.

* * *

To Move Heavy Tile

A FARMER recently engaged in drainage work on a rather extensive scale. Several carloads of 36-inch concrete tile were imported and distrib-

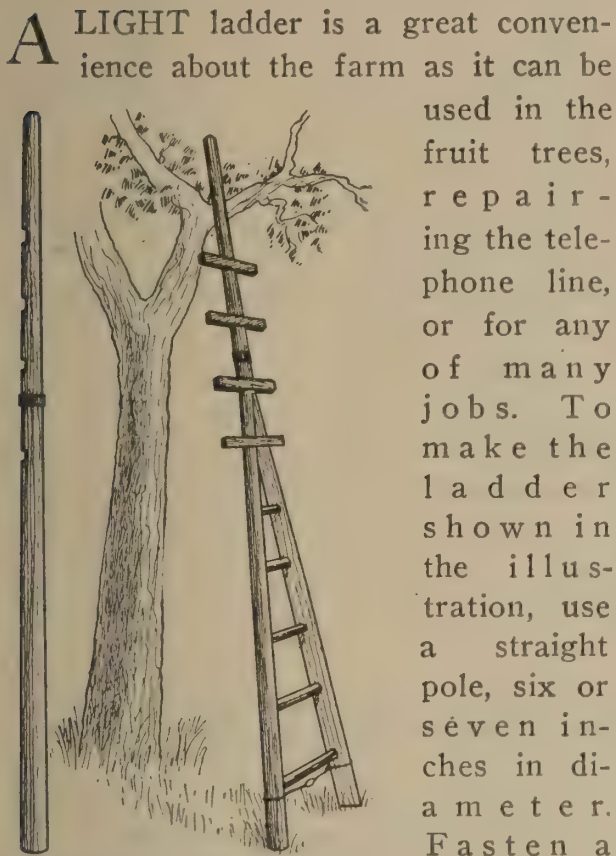


Device for Hauling Heavy Tile Over Soft Earth.

uted thru the water-logged territory. In some places the ground was so soft that it was impossible to haul the tile on wagon or motor truck close to where they were to be used. It was anticipated that much hand labor would be involved in pushing the tile distances which ranged from 200 to 600 feet from the unloading points to the main ditches. Finally a scheme was evolved of utilizing a six-inch wooden roller which was a little wider than the average tile, the ends of the roller being stationary end terminals of the iron axle on which the roller revolved. The roller ends were fastened by means of short lengths of chain to a singletree to which a horse was hitched and used as motive power to haul the tile—one by one—to the ditch edge where they were needed. In this instance the ground was level so that no additional precautions were necessary to stop the tile and keep it from coasting on to the heels of the horse on a declivity. A subsidiary roller may be fastened on the outside of the tile and fastened to the chains in such a way as to operate as a stop or brake on the tile where the need for so doing arises.

Handy Andy in the Yard

Home-made Ladder



Handy Ladder for Use About the Farm Is Made of a Split Pole.

A LIGHT ladder is a great convenience about the farm as it can be used in the fruit trees, repairing the telephone line, or for any of many jobs. To make the ladder shown in the illustration, use a straight pole, six or seven inches in diameter. Fasten a wire or ring around it about eight feet from

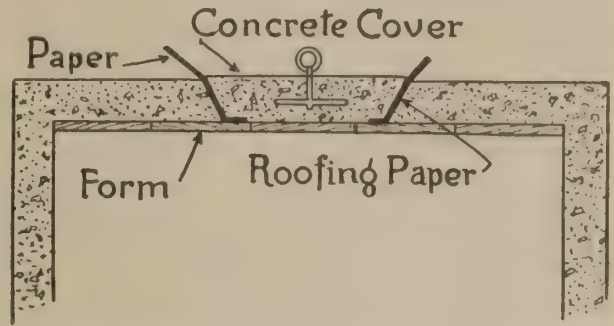
the larger end. Then split the pole and spread the two parts. Make a hole in each half for the bottom rung. After it is in put a wire under the bottom rung and twist it tight. Cut notches for the rungs above and nail them in place. This will be found a most serviceable ladder.

* * *

Make the Cistern or Tank Cover Concrete

WITH a few strips of roofing paper the cover for the new cistern, tank or septic tank can be made of concrete to conform with the rest of the structure.

When making the form for the top of the tank the sides of the manhole should be set at a slant as shown in the dia-



Cross Section of Concrete Cistern Cover.

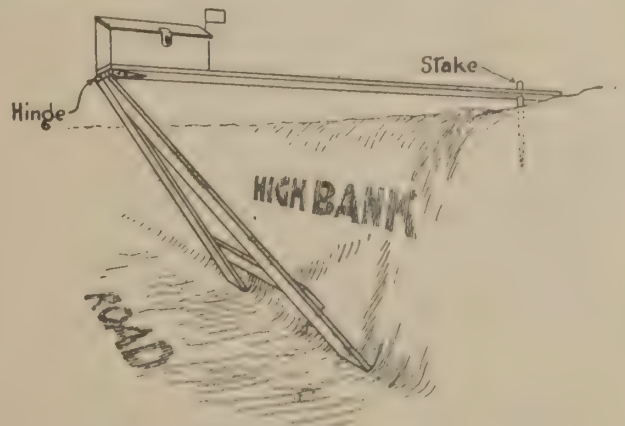
gram. After the concrete has hardened, remove the wooden forms at the side of the manhole and substitute in their place ordinary burlap or roofing paper, leaving a flap at the top and bottom.

Pour in the concrete, set the reinforcing and the ring in place and when the mixture has hardened a few days the cover can be removed without difficulty and it will fit exactly the form of the opening. With this arrangement an iron or a wooden cover becomes unnecessary and the top of the tank is perfectly smooth.

* * *

Handy Mail Box

A PATRON on a rural free delivery route who found the handiest location for his mail box, so far as distance from the house was concerned, at a high bank on the roadside, rigged up a device



Mail Box for High Bank Roadside.

which saved him the inconvenience of

walking to a farther location or of climbing up and down the bank.

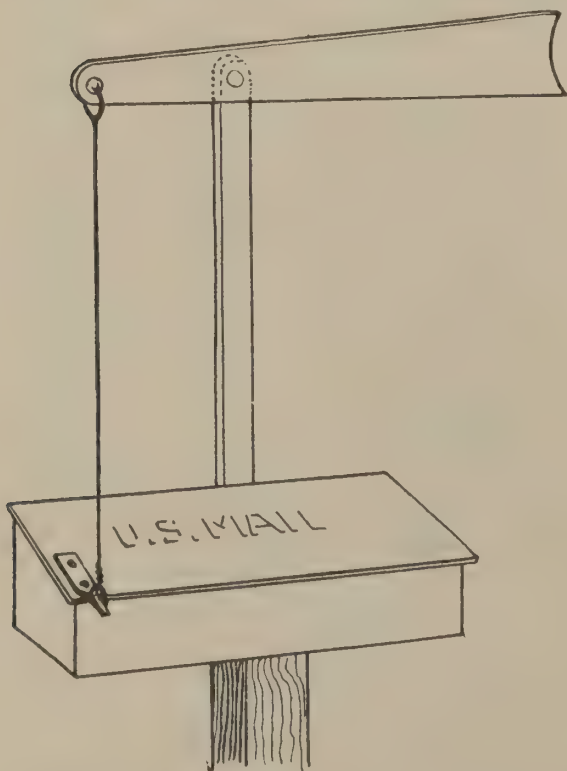
He nailed together three boards in an A-shape, to be set at the base of the A, and hinged to this another board, which latter served as a carrier and support for the mail box, as shown. The inner end of the support was provided with a hole, which dropped over an iron rod driven into the bank. The box was in a handy position for the postman, and when the patron went for his mail he lifted the end of the support from the stake, and pulled the box to him. After removal of the mail the box was returned to position.

This device has the added virtue of being entirely removable with little trouble so that it will not interfere with the working of the road close up to the bank.

* * *

Mail Box Signal

PATRONS of a rural route whose boxes are some distance from the



Signal for the Mail Box. When the cover is lifted the signal drops and the owner knows the mailman has been along.

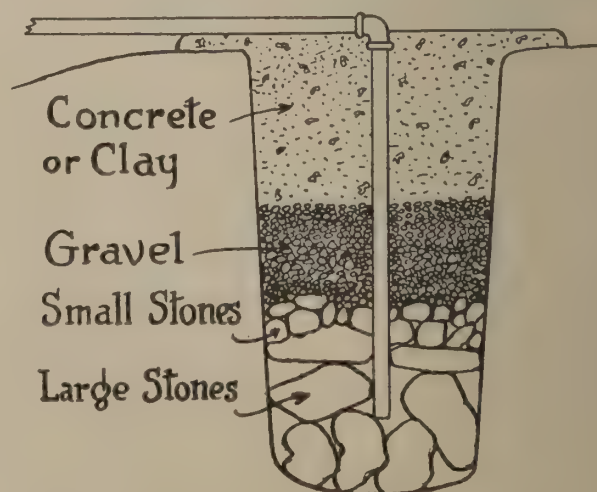
house will appreciate the signal described. It will prevent many useless trips to the box. For should no mail be deposited or if the carrier has not yet arrived the signal will be at right angles to the post. After he has opened the box to deposit the mail the signal will drop.

Paint the signal some bright color so as to be easily seen. The signal board is pivoted to the upright with a single bolt and a heavy wire runs from end of signal down to the box lid, and terminates in a loop. This loop hooks over a small piece of metal which has been riveted to the box cover. When the cover is raised the wire slips off. On removing mail, set signal for following day.

* * *

Making a Spring Flow Clear

A SMALL spring of good water that issued from the ground in a marshy spot where it spread over several square rods in a muddy ooze, was piped in a manner that forced it to flow in a clear stream to a trough at some distance, and the marshy spot was filled in with stones and earth till it was as dry as the surrounding ground. The spring was first dug out to a depth of 4 feet, then a piece of pipe 4 feet long



Showing How to Pipe the Spring.

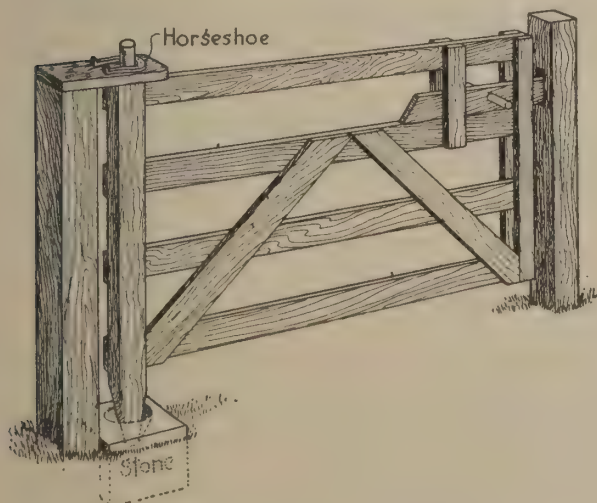
with an elbow joint at one end was placed perpendicularly in the excavation, with the lower end within 6 inches of the bottom. The bottom of the spring was filled with large stones which held the pipe in place and also allowed ample room in the crevices for the water to stand. On top of the large stones were smaller ones, then coarse gravel and sand. On top of this was a foot of impervious clay beaten down and extending for several feet around. Stones and earth were spread over this. Other joints of pipe were screwed into the elbow and ran to the watering trough. The water rose from the spring thru the pipe and flowed off rather than thru the earth as formerly. In a few days after the pipe was put in, the ground was comparatively dry and remained so.

* * *

The Both-Way Gate

I FIND this gate very convenient, and it does not require any hinges or any hardware material at all.

You can make this gate any height or length you want it and have a 2x4 at each end which extends up about two inches higher than the gate post and far



Both-Way Gate That Has No Hinges.

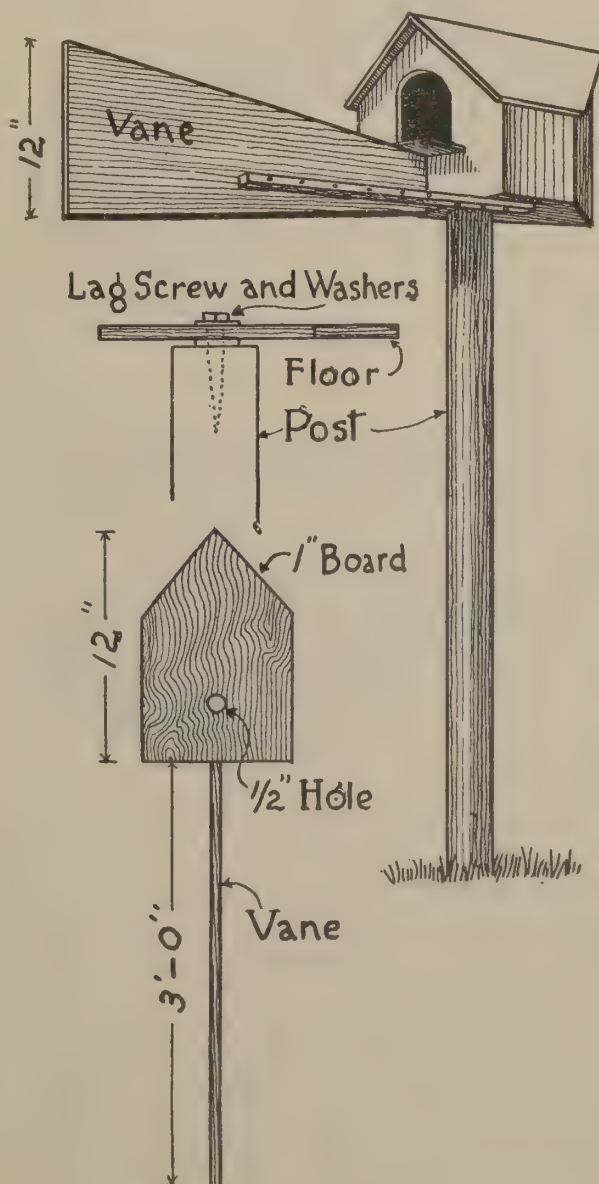
enough below to go into a hole in stone you have at the foot of the gatepost. Nail a board at top of gatepost with a

two-inch hole in it for the 2x4. On the other side have a hole one inch wide and three inches long chisled in the post at the other side.

* * *

Pigeon Cote Weather Vane

HERE is a combined pigeon house and weather vane that I built in our yard, and I know others will enjoy building a similar one. I planted a round post 3 feet into the ground. The floor of the house is an inch board, with a $\frac{1}{2}$ -inch hole drilled in the center at a point so that it is well balanced. One-half inch material was used for the vane sides and roof. Fasten the vane



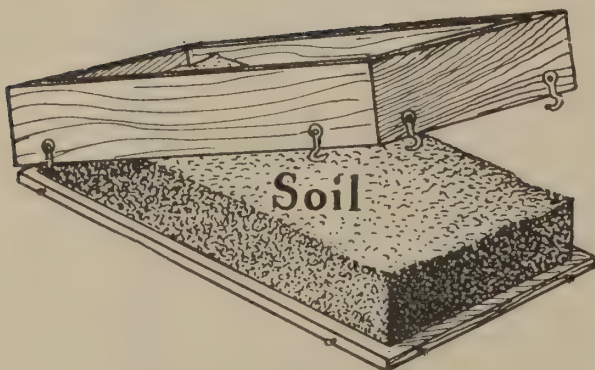
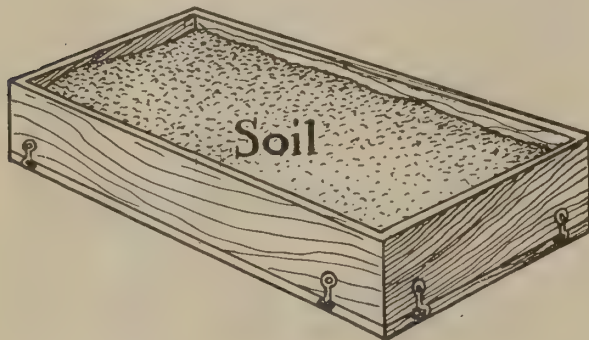
Weather Vane and Bird House Combined.

with two 1-inch strips, 2 feet long one on each side. The door for the pigeons to enter is $3\frac{1}{2}$ by 4 inches, and has a little platform in front of it as shown in the drawing. The vane not only tells the direction of the wind, but prevents the cold air from entering the nest.

* * *

Improved Seed Flat

WHEN plants that have been grown in wooden boxes or flats are ready to be taken out, it will be much easier to get at them if the sides of the box can be removed. Such an arrangement is shown in the illustration. The sides are



Seed Flat That Can Be Taken Apart.

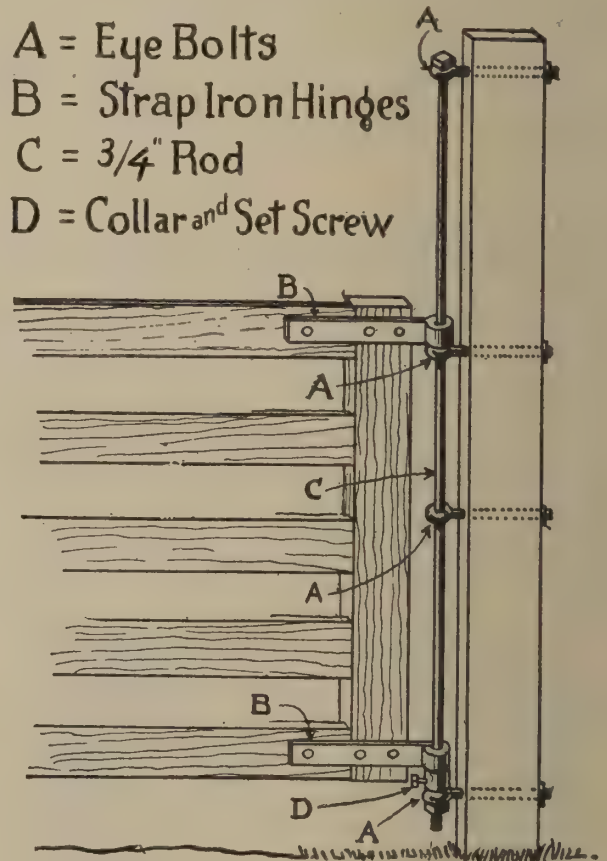
nailed together and attached to the bottom by means of hooks and screw-eyes. When the plants are large enough to be transplanted from the flat, the sides are unhooked and lifted up from the bottom, the soil with the plants in it remaining undisturbed on the bottom board. The plants are then easily separated and pulled up. When ready to use again, the sides are hooked to the bottom, and the

flat filled with new soil. Very little root disturbance will result when the small plants are cut from the mass of soil with earth clinging to their roots.

* * *

An Adjustable Gate

EVERYONE who has gates to open in yards or buildings where there is bedding for animals knows how difficult it is to swing the gates above the bedding and still have them low enough to turn hogs. I have a gate that we have used for several years very satisfactorily, as it is adjustable and may be raised



An Adjustable Gate Hanger.

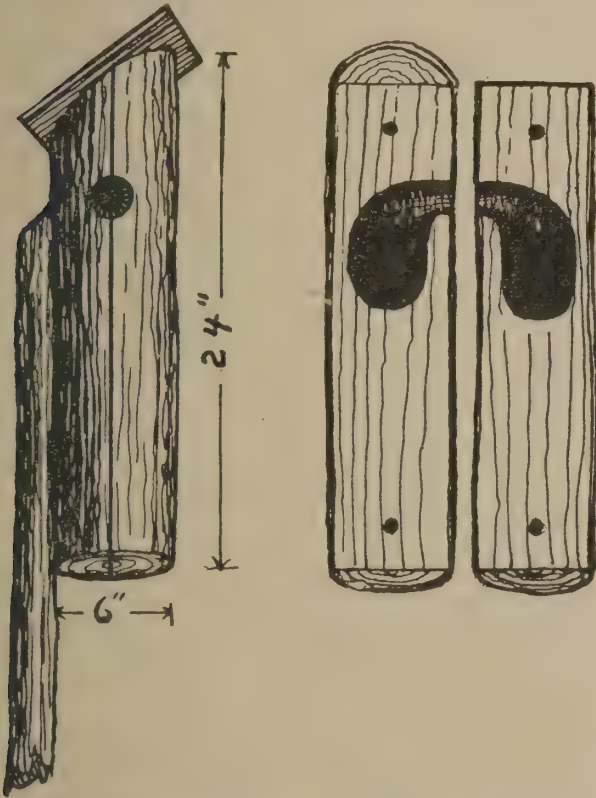
or lowered to swing clear of the bedding. Have two strap-iron hinges made with eyes large enough to slide easily on a $\frac{3}{4}$ -inch rod. The eye-bolts are set into the post and the $\frac{1}{4}$ -inch rod run thru them and held top and bottom by nuts, after the gate has been hung, as shown by the drawing. At the bottom of the rod is a collar with setscrew.

Upon this collar rests the lower hinge of the gate. When it is desirable to raise the gate, the collar is raised, lifting the gate, and the setscrew holds it in place.

* * *

A Simple Bird House

EVERY boy likes to build a bird house to provide a home for his feathered friends. Here is one that I have built and found it very attractive, as well as making a comfortable home for birds. Get a poplar sapling free from knots about five or six inches in diameter and two feet long. Saw the ends off at an angle so that it will shed

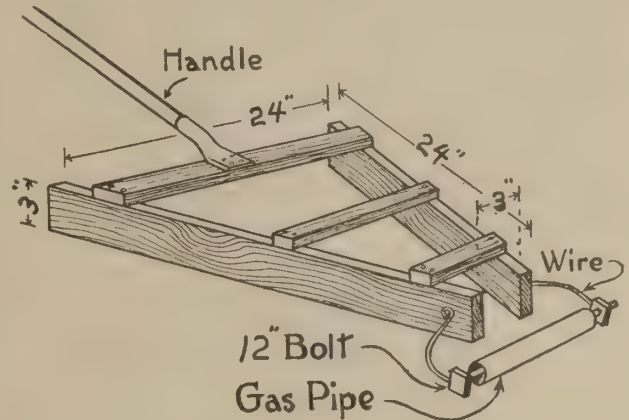


Bird House Made of Split Poplar Sapling.

water. Split or saw it in two in the middle. Hollow out the two halves in the shape of a pear, as shown in the sketch. This will form a pocket for the nest when the two pieces are put together. Fasten the pieces together with a screw, so that they can be taken apart and cleaned. If a roof is desired, use a piece of tin or zinc, or a shingle.

Garden Row Coverer

A DEVICE for covering up rows and packing the loose dirt often is a desirable tool, especially for gardeners. The one I use is shown in the accompanying illustration and it is so constructed that it not only covers the rows



Outfit to Cover Planted Rows.

after the seed is planted but has a roller attached that packs the soil.

Take two boards 2 feet long and 3 inches wide and fasten them together in a V-shape, as shown by the drawing, leaving them at least 2 feet apart at the wide end and about 3 inches apart at the small end. Fasten a long handle to the wide end and the device is complete.

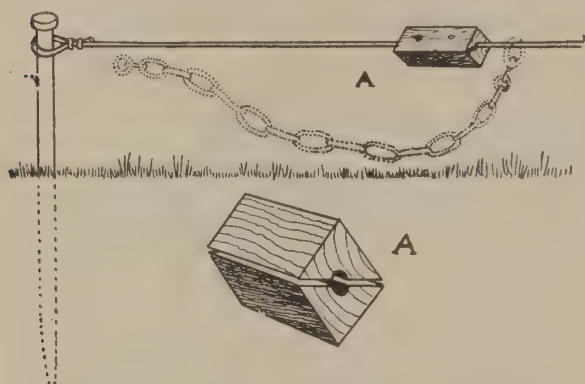
For the soil packer take a piece of gas pipe 8 or 10 inches long, run a 12-inch bolt thru it. Fasten a wire to each end of the bolt and attach to the frame. This forms a roller that packs the soil slightly.

* * *

To Tether a Cow

IN the land of small 5 to 20 acre fruit and alfalfa "ranches" a considerable amount of good feed can be saved by staking the cow out along the road or irrigation ditches. We use a wire guy cable or hay fork steel cable or rope with a ring or loop at each end. A buggy axle cut in two in middle, sharpened to point is used for a stake. Cut off the spindle one inch from shoulder or long distance

groove, which makes a short stub for drive cap. Such a stake can be driven with 6 to 10 pound sledge in any soil and will hold the strongest cow except in very soft mud. To keep the chain from winding, bore a hole $\frac{1}{8}$ -inch smaller than the cable thru a block of wood either round or square two to three inches in diameter and four inches



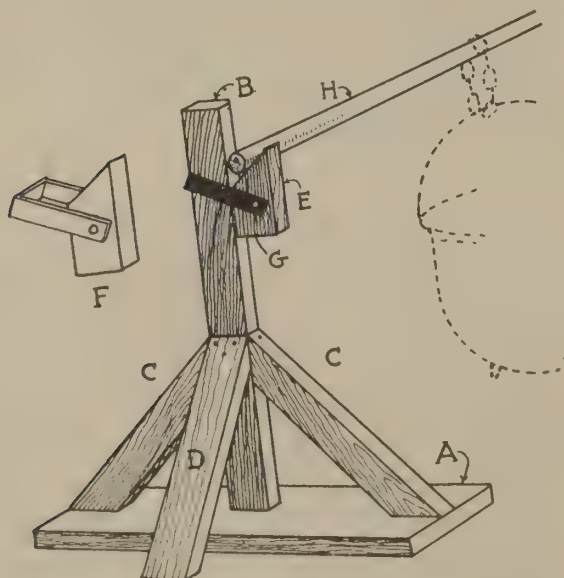
Tether That Holds the Cow But Gives Her Plenty of Freedom.

long. Then saw corner-ways to split block so it can be put on cable and nailed together over the cable so it will not slip. It should be fastened the length of the tether chain from each end. The chain should have a swivel.

* * *

Support for Kettle

A HANDY pole support for kettles, etc., is shown in the following



Rack for Holding Bar on Which a Kettle Is Slung.

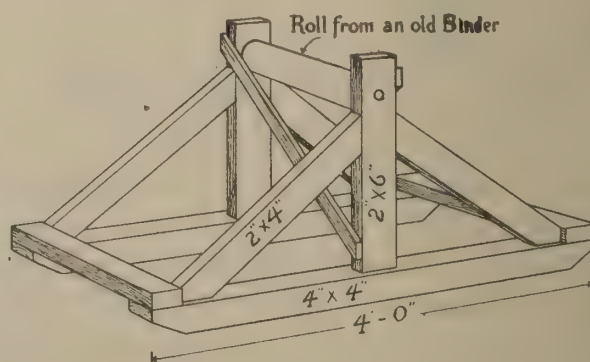
sketch. With this device the position of the kettle can be quickly adjusted to suit the fire while in use. A pair of these supports can easily be made by anyone and will be found to be very handy.

To make, take a 2-inch plank, 8 inches wide and 3 feet long for the bottom (A). Next take a 2 by 4, (B), about $3\frac{1}{2}$ feet long and spike it firmly to the bottom (A). Use two 2 by 4 braces (C) about 18 inches long and spike them to the post (B) and bottom (A) to make the parts firm. A third brace (D) is used to prevent side motion. Next take a 2 by 4 block (E) about 8 inches long and saw it slanting on the top to hold the pole (H). Take a piece of buggy tire or any piece of scrap iron and bend it as shown in (F), being careful to get it bent long enough so when it is hinged to the block (E) at (G) and slipped over the post (B) it will cause a binding motion making the block (E) grip the post firmly. Raising the pole releases the weight on (E) which can then be readily adjusted to any position.

* * *

Saw Horse

THIS is a handy saw horse when cutting poles into stove wood. The roll is taken from an old binder. The height of the horse should be made to



Hold the Logs for Sawing.

correspond with the height of the saw rig. I made one last spring, and it is a

great labor saver when handling heavy logs and poles, as it supports the pieces and the roller makes it easy to move them.

* * *

Quick-Acting Latch

LAST summer I needed a quick-acting latch on one of the gates on my farm, so I made this one and have found it very satisfactory. The drawing explains its construction and shows how it acts. To make this latch use one piece of strap iron, $\frac{1}{8}$ inch thick, 1 inch wide and 5 inches long. Drill four $\frac{3}{16}$ -inch holes in this piece. Fasten this to the gate post, leaving 1 inch projecting. The second piece should be 7 inches long. Drill

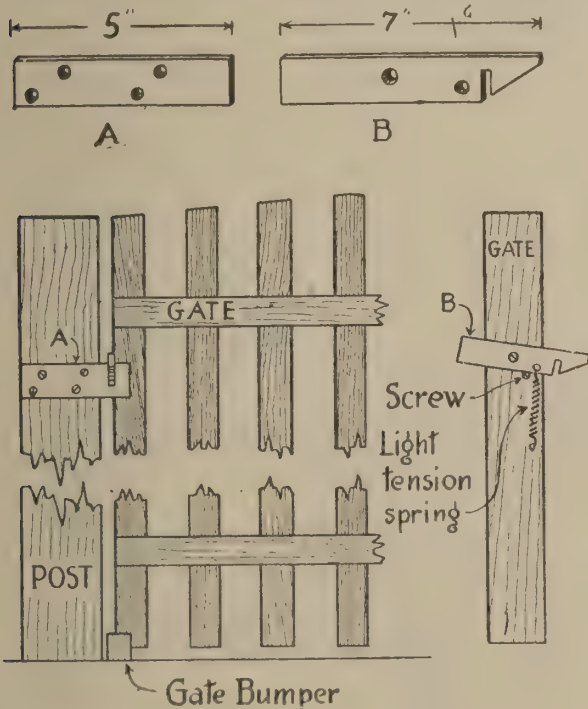


Diagram Showing How Quick-Acting Latch Is Made.

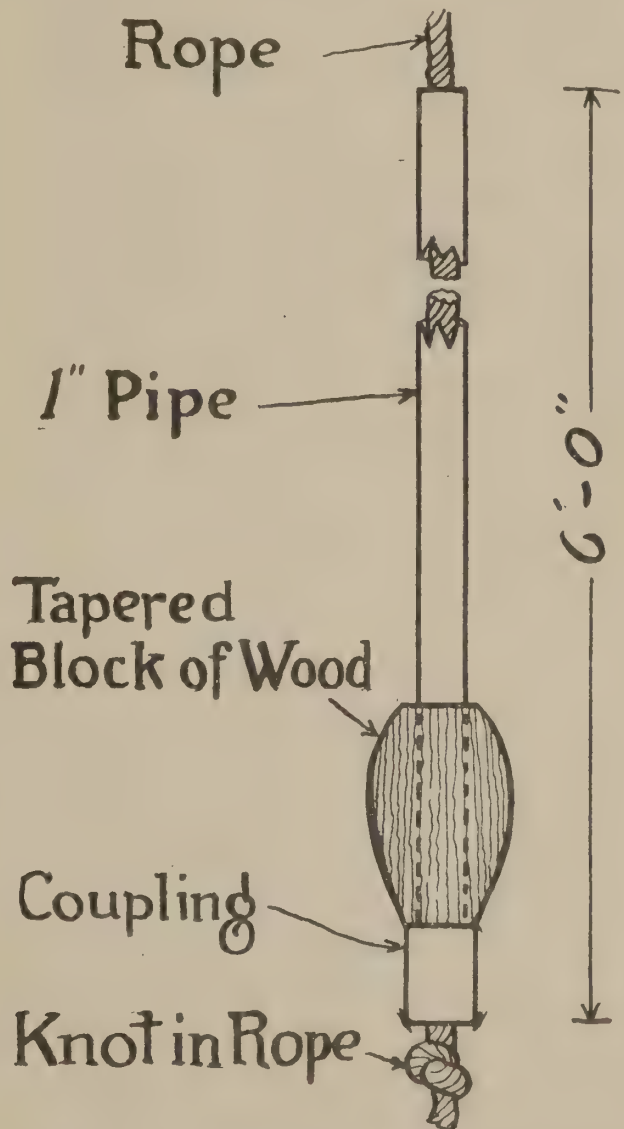
a hole in the center of it large enough to take a $\frac{3}{16}$ -inch flat-headed screw. Countersink the hole with a larger drill. Then make a slot $1\frac{1}{2}$ inches from the end large enough to engage the first piece. Just back of the slot drill a small hole for a light high-tension spring. Three-sixteenth inch from the top saw off the end diagonally, as shown in the drawing. You then screw the iron onto the gate and attach the spring, which

should draw the catch down $\frac{1}{2}$ inch and place a wood screw under it. When the latch is engaged it will stand level.

* * *

Recovers Pump Cylinders

WHEN a pump cylinder comes apart and drops to the bottom of the well it is a difficult task to recover it. The illustration shows a tool I devised



Device for Recovering Pump Cylinders That Drop to Bottom of Well.

for recovering pump cylinder and it has done the work both for myself and a number of my neighbors. I think it is worth its weight in gold.

Procure a piece of 1-inch pipe with a thread and coupling at one end and about 6 feet long. Take a block of wood 4 inches in diameter and 6 inches long.

Bore a hole the size of the pipe thru the center of the block lengthwise and insert the pipe. Now taper the block down to the size of the coupling at the bottom end. Put a rope thru the pipe and securely knot it and the tool is ready for use.

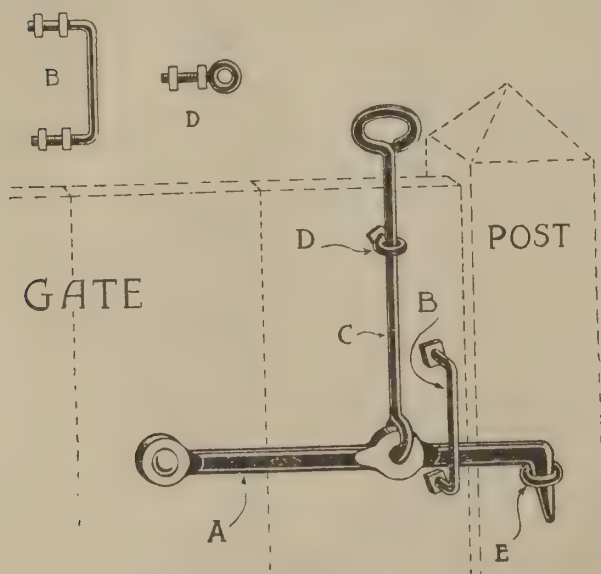
The weight of the pipe when dropped to the bottom of the well drives the wood into the pump cylinder with enough force so that it will hold. I use my hay rope as a line to attach to the tool.

* * *

Two-Way Gate Hook

HAVING a small swinging gate to go thru every morning and evening while doing chores, I devised the following hook:

The outfit consists of a long hook (A) made of half-inch iron flattened at one



Gate Fastener that Can be Easily Opened from Either Side.

end and within about two inches of hook end, with $\frac{1}{4}$ -inch holes drilled thru each flattened place. One staple (B) made of $\frac{1}{4}$ -inch iron, 5 inches wide, with prongs 3 inches long, each prong to be threaded $2\frac{1}{2}$ inches and with two burrs or nuts on each to allow for any adjustment. One long $\frac{1}{4}$ -inch rod (C) with small eye on one end and hand hold on other. One eye bolt (D) with

two burrs on and threaded for $2\frac{1}{2}$ inches. One long eye bolt (E), one $\frac{1}{4}$ -inch bolt and nut to drive in post of one $\frac{3}{8}$ iron.

When pieces have been made and put on gate they will look as the diagram shows.

* * *

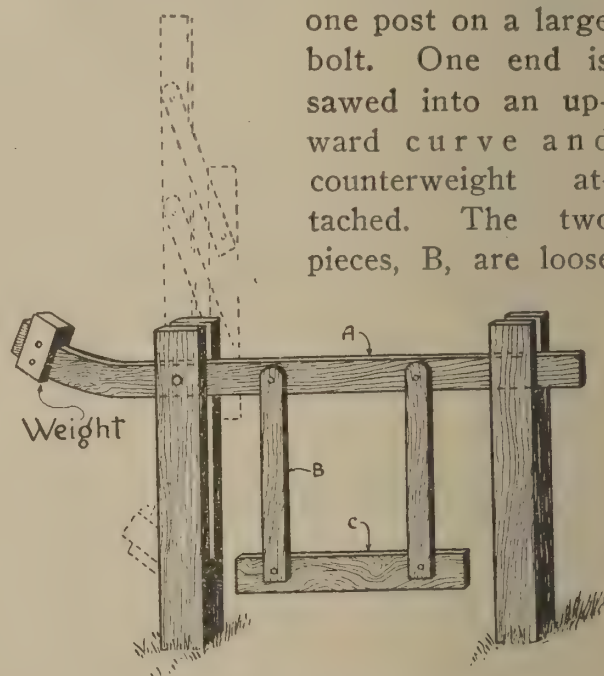
Gate That Lifts Up and Folds Vertically

WHERE the conditions are such that a gate cannot be swung either way conveniently a vertical folding one like that shown in the sketch will be handy.

The gate posts should be built either of two separated boards, or if solid, should be split down equally far.

The top board of the gate A pivots in

one post on a large bolt. One end is sawed into an upward curve and counterweight attached. The two pieces, B, are loose



Gate That Lifts and Folds.

bolted to A and bottom piece C is then loose bolted to B.

The counterweight will serve to raise the gate to a vertical position with a slight lift with the hand but is not so heavy but what the gate will rest normally in the slots when allowed to drop into place.

When raised vertically the entire gate folds into a compact piece allowing the user to pass thru the gate unobstructed.

Handy Andy About the Farm

The "Slip"

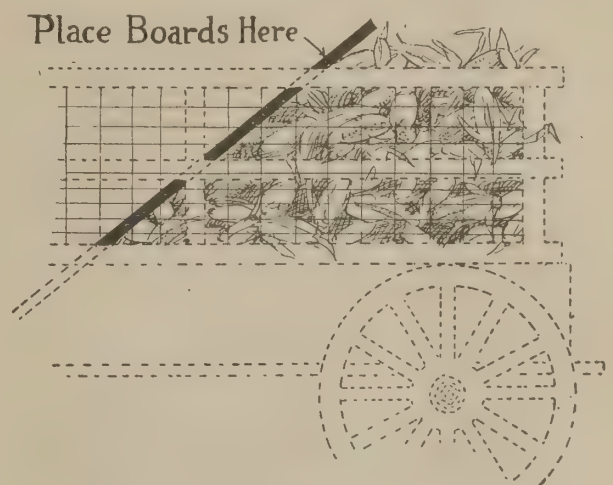
THE "Slip" is a hauling device used at several places in the West and Southwest; and it would seem that there is no reason why it should not come into general use. Its use is mostly hay hauling, tho it can be used in hauling many other things. It consists of a platform on the ground with an upturned front end. It is usually made of heavy boards, or plank, the boards being preferable as they are so much lighter. Its usual dimensions are from 12 to 16 feet in length by 6 to 8 feet in width. The frame-cross pieces of inch material are spiked or bolted on the upper side. It is drawn endwise, its upturned front end allowing it to slide over the ground. In hay hauling it has the advantage over a wagon in that the hay does not have to be pitched very high. And now that we have the hay fork, the hay can be hoisted into the barn or onto a stack as easily from it as from a wagon. Children and women can haul hay on it, when they would not be strong enough to pitch onto a wagon. It has an advantage over the push or bull rake in that it will slide over uneven ground where such a rake could not be pushed. Also, it can be used in hauling hay from the field over the roads to the barn, where a push rake could not be used. A ton of hay can be hauled on it. Thousands of tons

of hay are hauled from the fields in Southern Colorado on this device annually.

* * *

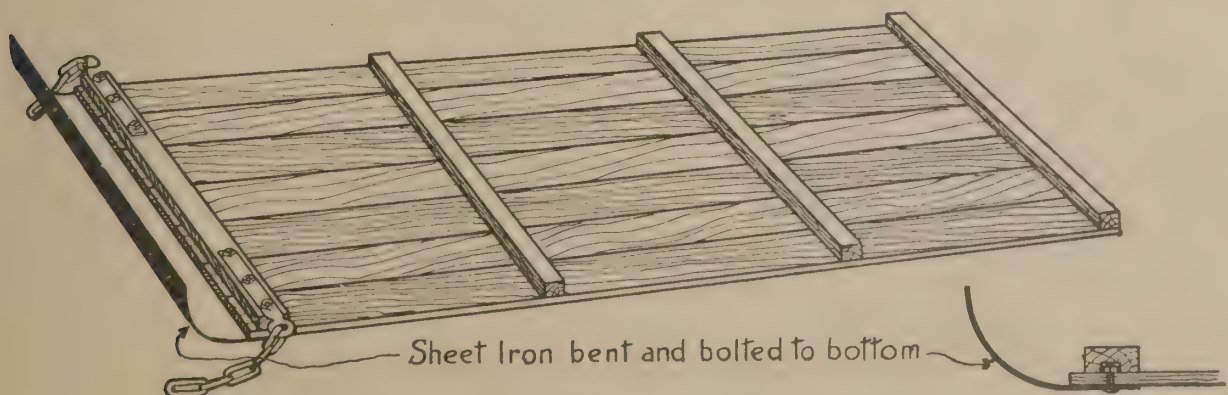
Simple Method of Unloading Corn

WHEN a wagon box is full of corn it is not necessary to pick part of the load off before the balance can be



Method of Unloading Corn.

shoveled. When loading the wagon start at the rear and when the box is partly filled put in a board at an angle, as shown in the illustration. When the wagon is being unloaded start shoveling down the board. It will not be necessary to either take out the end gate, or pick any of the corn off. This idea saves much time and labor.



The "Slip" Is a Useful Farm Device.

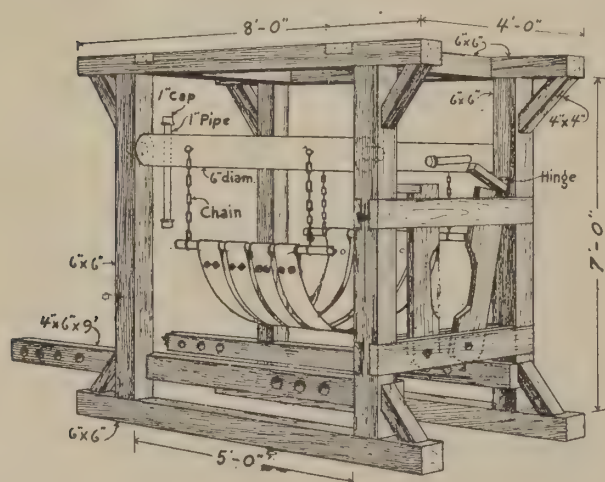
Stocks for Trimming Cattle's Feet

ON all farms where there is a large herd of cattle there is always one that needs its feet trimmed or has a sore foot. It is quite a job to get at it unless you have a set of stocks. They are also a great help when dehorning cattle or putting a ring in a bull's nose.

The accompanying drawings are of a very successful set having been used on some of the largest pure-bred stock farms in the country.

All of the timbers used are yellow pine. They are spliced and bolted together with one-half inch carriage bolts. By following the drawings one can see that it is a very simple outfit to build and almost anyone that has ever used wood-working tools can do it.

The belt or sling which is put under



Stock for Trimming Feet of Cattle, with Details of Construction.

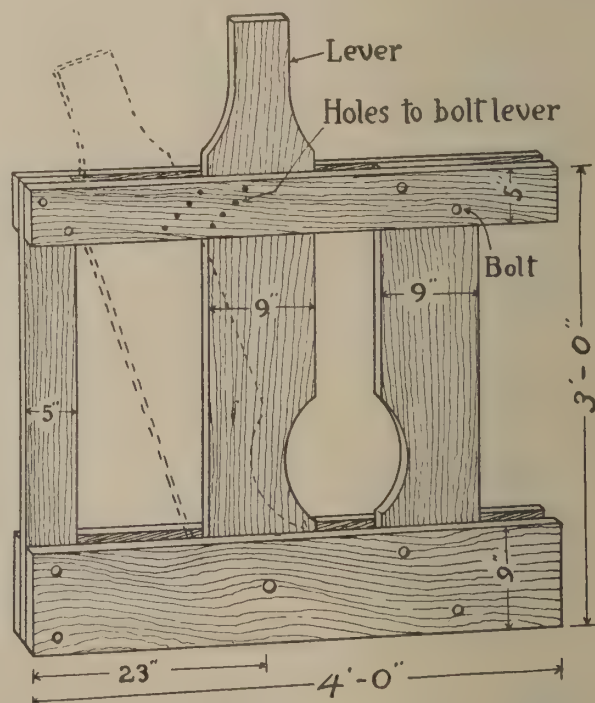
the animal's body, is made by cutting up an old thresher belt. It will take 4 pieces 6 inches wide and 6 feet long. Six inches of each end is lapped over forming a loop and is bolted by 2 five-sixteenth inch carriage bolts about one-half inch long. These are strung on 2 cold rolled steel rods 42 inches long and 1¼ inches in diameter. These are hooked to the rollers by short lengths of either chain or cable.

To use the stocks an animal is led in and its head locked in the stanchion in front. The sling is then placed under its body and it is raised up so that its feet are almost clear of the ground. A piece of strap is then placed around the foot which is to be trimmed or doctored and it is tied to the side-rail. It is then a very easy job to trim it as the animal is held immovable.

* * *

Catches and Holds Hogs

OF TENTIMES it is necessary to capture and hold a hog. This is difficult, especially with the older and larger animals. Here is a design for a hog catcher that we use. It has helped us a lot in catching big sows. The draw-and it is tied to the side-rail. It is then a very easy job to trim it, as the animal is held immovable.

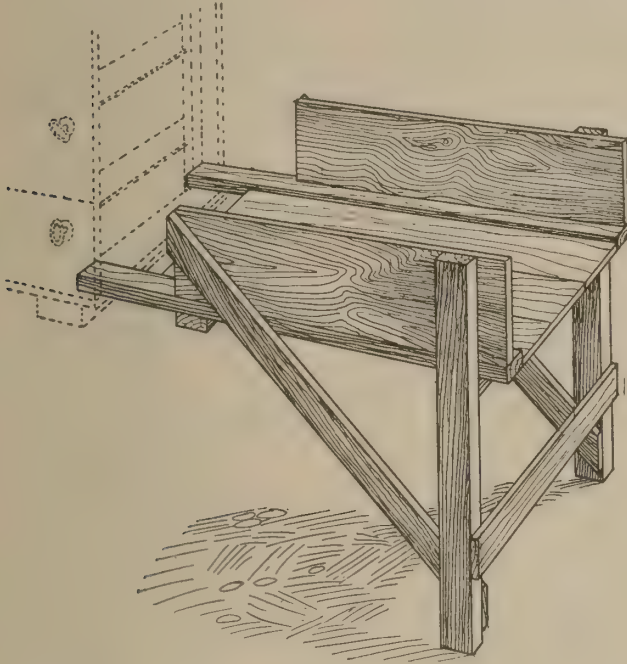


Crate to Catch the Hogs.

Bolt the catcher to a door frame and have a chute leading to it. Then drive the hog thru with the lever open. As he puts his head thru, close the lever tight and put a bolt in one of the holes in the top board. Then the fun starts. I like *Farm Mechanics* very much. It is a great help to me.

An Easily Made Shoveling Stand

IT is annoying when hauling corn to have to begin to unload by hand to come to the bottom of the wagon, where



Shoveling Board That Is Height of Wagon.

one can begin shoveling. For this reason I constructed the simple stand shown in the illustration. It pays for itself many times over the first year one uses it.

The frame consists of two 2 by 4's about 5 feet long and two others about 3½ feet long or the width of the wagon. Two additional 2 by 4's are needed to serve as legs and should be long enough

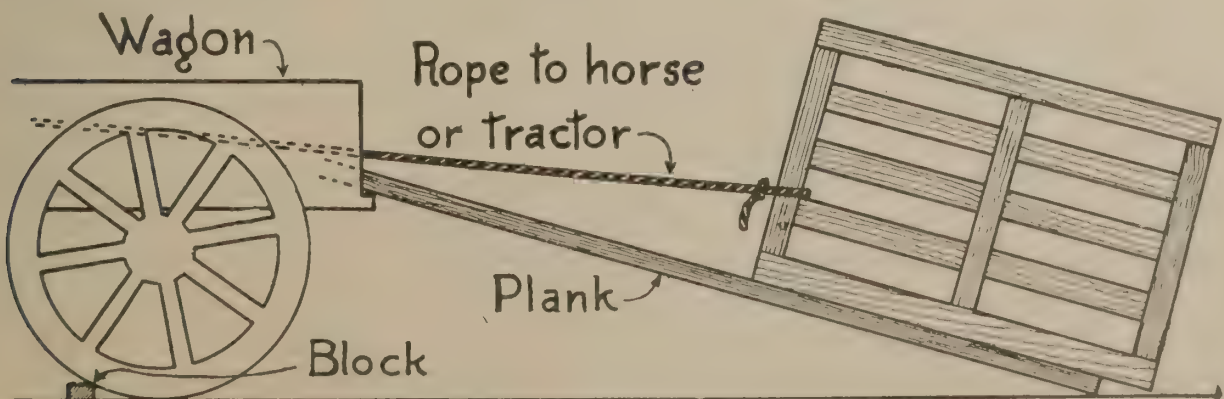
to make the stand about the height of the wagon floor, extending about 1 foot above the frame to permit for attaching sideboards to hold the corn when the endgates are removed. The legs should be braced to make the stand rigid and strong. Then, with a floor nailed to the frame, the stand is complete.

In use, the stand is simply placed behind the wagon, the endgates being lifted about 2 inches for inserting the two ends of the frame.

* * *

Easy Livestock Loading

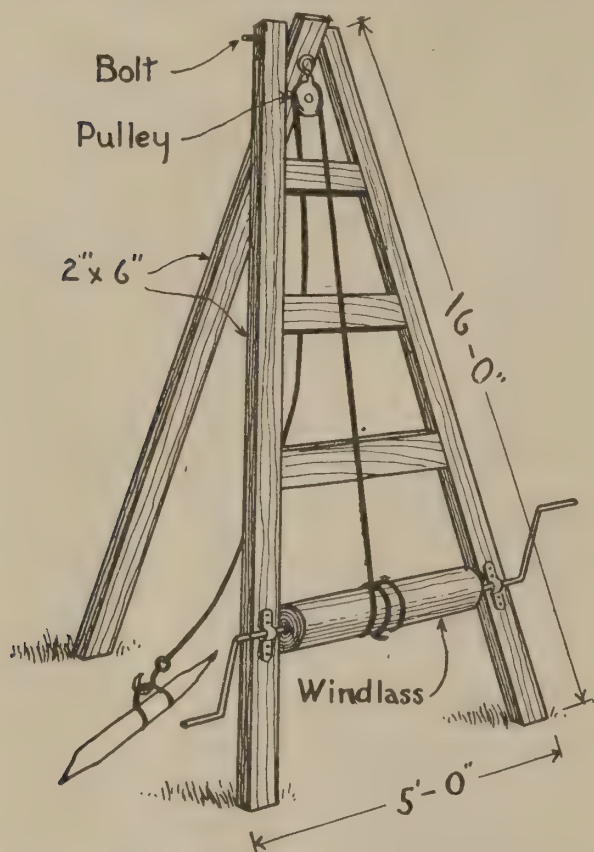
PERHAPS some of the readers of Handy Andy have tried to load a heavy hog or sheep in a crate up into a wagon or motor truck with no one to help but the wife or a young member of the family. A simple device that I have used has saved me many a dollar and much backache. When I had a crated animal to ship, I took a wide board, or two boards are better, and rest them on the wagon bed with the end gate removed. This makes an inclined plane, up which it is easy to slide the crate. By wetting the planks the crate slides more easily. A still heavier load can be handled by attaching one end of a rope to the crate and the other to the single or doubletree. Then the horse or horses can do the work, or, better still, the tractor may be used.



Showing an Easy Method of Loading Crated Livestock onto Wagon or Truck

Lightens Killing Work

I HAVE found many of the devices described and illustrated in the *Farm*



Handy Windlass for Handling Hogs.

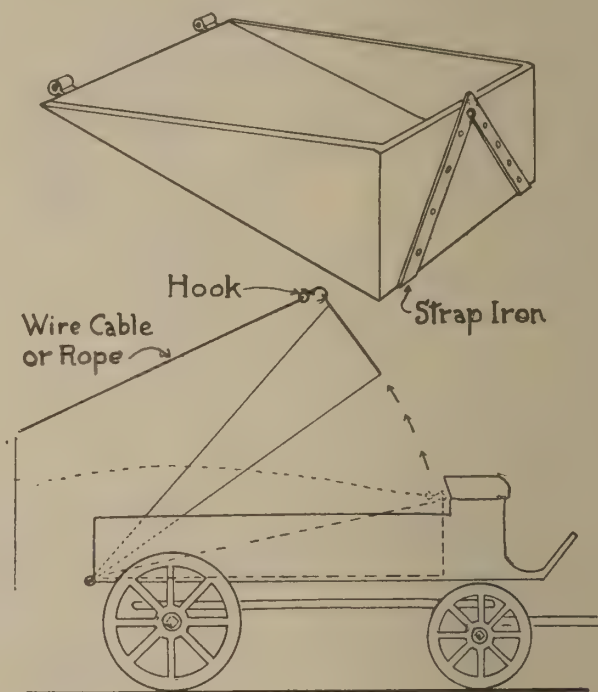
Mechanics Handy Andy Department very useful, so am giving one that I have used. It is a three-legged derrick for use at hog killing time, and also makes the work of handling a beef carcass much easier. I first made a triangle, as shown in the illustration, of three pieces of 2 by 6 inch lumber 16 feet long. Two of them were made in the shape of a ladder, the legs being five feet apart at the base, with the tops just far enough apart to permit the third piece to be bolted between them. A strong bolt was used to hold them together at the peak, and to fasten a pulley to. A windlass was put on the ladder near the bottom—a strong round stick, about four inches in diameter will do. A strong rope put thru the pulley and wound around the windlass makes the device ready for business. Iron handles were put at each end of the windlass, two being used so that

beef carcasses may be handled. The triangular derrick should be supported by a guy rope or wire attached to a building or tree to hold it in place.

* * *

Wagon Box Unloader

UNLOADING a wagon by the ordinary method requires considerable time. That is why manufacturers of motor trucks have perfected hoist bodies, which are lifted by power and the load



False Bottom Makes Unloading Easy.

slides out by gravity. This same principle may be applied to any wagon or truck. The accompanying illustration shows how a false body may be built and installed in the ordinary wagon or truck body. The false body is constructed in the shape of a scoop, the sides sloping until they are even with the bed at the rear end. This end is hinged to the rear of the wagon or truck. The front end of the false body is reinforced with strap iron, and has a hole in the center near the top. The loaded wagon is driven to the point where it is to be unloaded. A rope or cable is attached to the hole at the front of the body and to some sta-

tionary object to the rear. The wagon or truck is started slowly, the rope or cable lifting the false body so that the load slides out. When the body is empty the vehicle is backed, the body drops into place and is ready for a new load.

* * *

To Oil Blades of Corn Cultivator

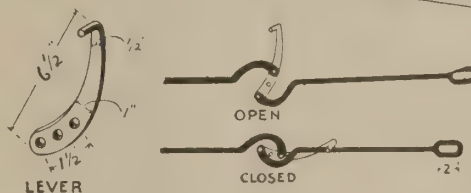
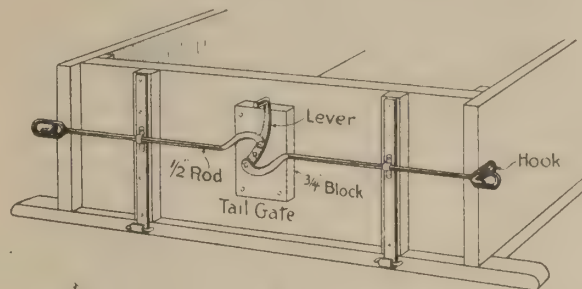
WHEN plowing corn I have found that it generally pays to grease the shovels every time I quit work as a sudden shower may delay the cultivation for a day or so and rusty shovels take the joy out of the job. A convenient holder for the heavy oil to be applied to the shovels is an old shoe polish bottle—the kind that has a swab attached to the cork. The swab makes it easy to apply the oil evenly to the shovels, and besides the user does not get the lubricant on his hands or clothes. By using this method it only takes a minute or so to oil the shovels, and there is no danger of their becoming rusty.

* * *

End Gate Fastener

THE end gate fastener shown in the illustration will be found very

efficient, as it may be easily opened even when the wagon box is heavily loaded with such materials as sand or grain,



Showing How End-Gate Fastener Is Put in Place and Operates.

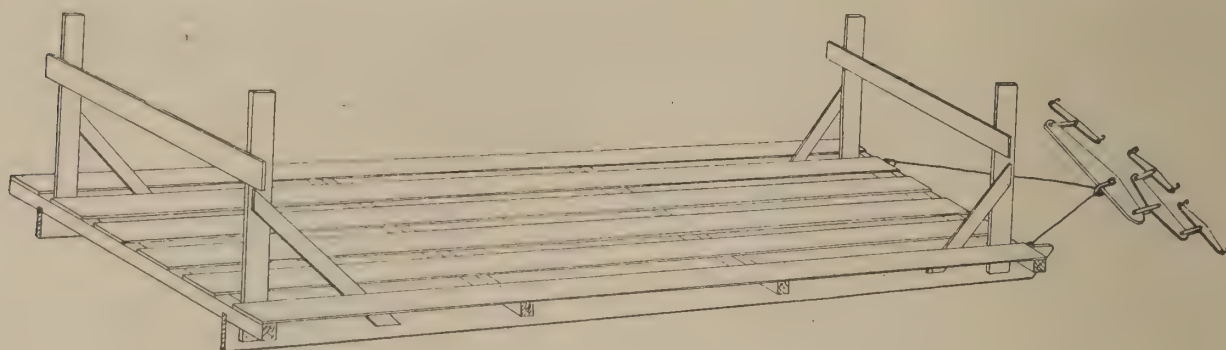
and, at the same time, it will hold the gate securely in place. A $\frac{3}{4}$ -inch block is fastened to the center of the end gate. To this is attached a lever, made of strap iron, one end of which is bent at right angles and rounded for a handle. At the center and on the lower end of the lever are holes into which are bolted the bars that extend to the hooks bolted to the edges of the wagon box. These bars are shaped like a ladle at one end and have eyes at the other. The eyes slip over the hooks, the lever is turned and the end gate is held securely in place. To open the end gate the lever is turned upward, and the eyes of the bar slip off the hooks. The leverage exerted by the shape of the bars and lever holds the gate tightly.

* * *

Brush Sled

A BRUSH sled is useful in getting a brush out of an orchard in which the trees are so large that a wagon cannot be used. It has some advantages over a wagon other than that it does not catch on the tree limbs. It is not necessary to lift the brush so high, and it is more convenient to pack the brush on it.

The runners are made of 2×8 -inch lumber and are from 14 to 20 feet long. The cross pieces are of 4×4 or 2×6 -inch



Brush Sled That Is Simple in Construction.

material and should be about 7 feet long. The floor may be made of 1x12-inch boards or any material available. Corner posts should be of 2x4 or 2x6-inch material and should be about 4½ feet long. They should be well braced. The runners should be about 4½ or 5 feet apart.

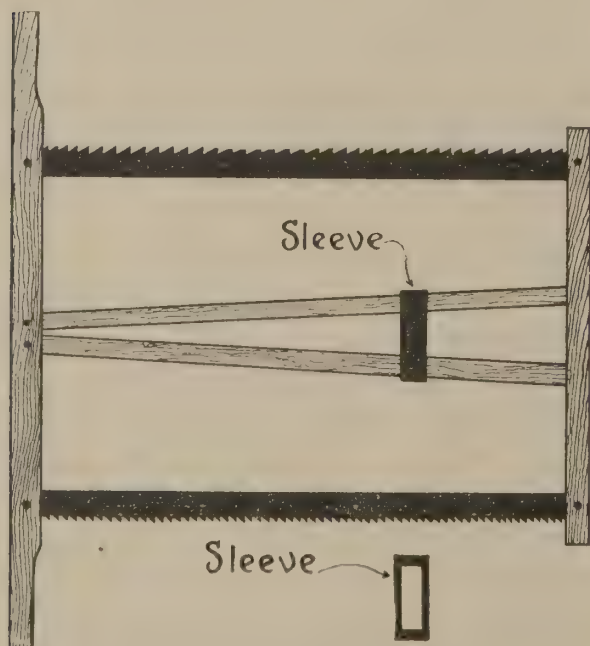
It requires three ordinary sized horses to pull a good load of brush a short distance about the farm.

This sled is handy for moving fodder or bulky articles about the farm.

* * *

A Double-Blade Buck Saw

A FRAME carrying two buck-saw blades will be found very desirable, since a fine blade with little set is best for cutting seasoned hardwood, while a coarse-blade with plenty of set



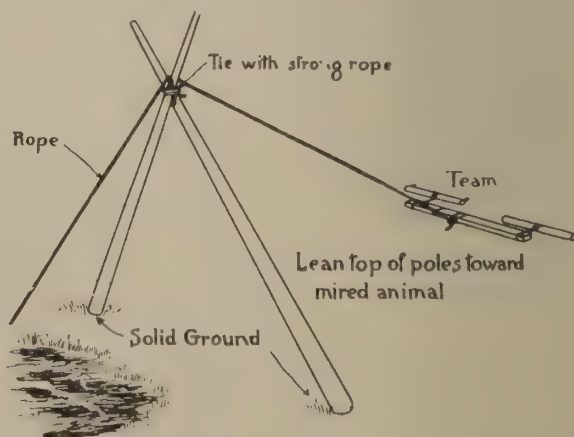
Double-Blade Saw.

is more satisfactory for sawing green wood. Such a frame is shown in the illustration. A saw blade is attached at each side of the simple wood frame, while the combined stiffener and tightener is placed in the middle. This tightener consists of two straight bars mortised loosely and bolted in the frame at one end, while at the other end they are movable in a groove on the inside of the frame. When these bars are moved slightly apart the frame becomes loose and the blades slacken. To tighten the blades, drive the two bars closer together by means of an iron sleeve, or loop, that slides on them.

* * *

To Rescue Mired Animals

HAULING out an animal that has become mired is not an easy task, especially when the animal has become



Equipment for Rescuing Mired Animals.

frightened and is struggling to free himself. The accompanying drawing shows a method that has been used and does the

work. Take two strong poles and tie them securely together near one end. Set them up on the solid ground as near as possible to the hole in which the animal has been caught. After passing a rope around the animal, run it thru the top of the poles and hitch a team to the other end. Tip the poles toward the animal. As the team pulls, the poles will rise, helping to lift the animal and pulling him toward the solid ground at the same time.

* * *

Gate Closing Device

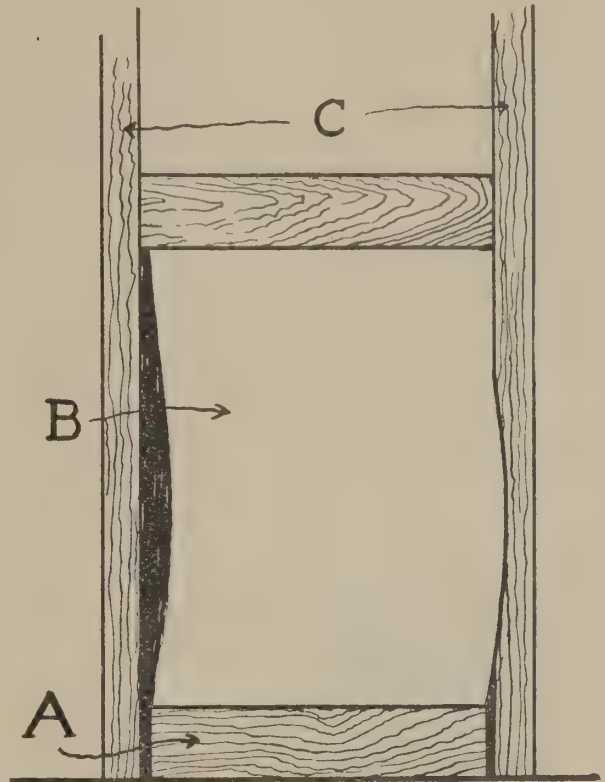
THE illustration at the bottom of the page shows a handy device for holding a gate shut.

Take two pieces about 15 inches long, D and E, hinge them at A, B and G. Place a small pulley at C. Next run a small rope from the hinge joint G, thru the pulley C. At the end of this rope place a weight, F. When the gate is opened the hinge G moves away from the pulley C, drawing the weight with it and in return draws the gate shut.

* * *

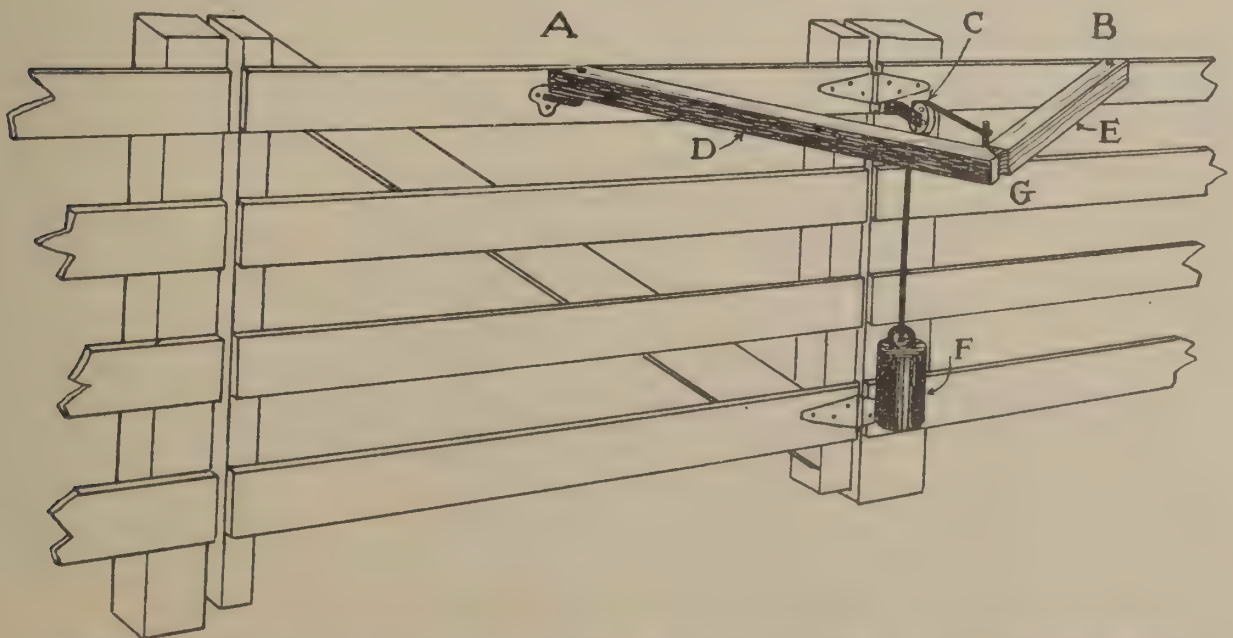
Hog House Door Covering

THIS is a device for keeping the cold out of the hog house. C represents



Curtain Keeps Out the Cold, But Does Not Prevent the Hogs from Using the Door.

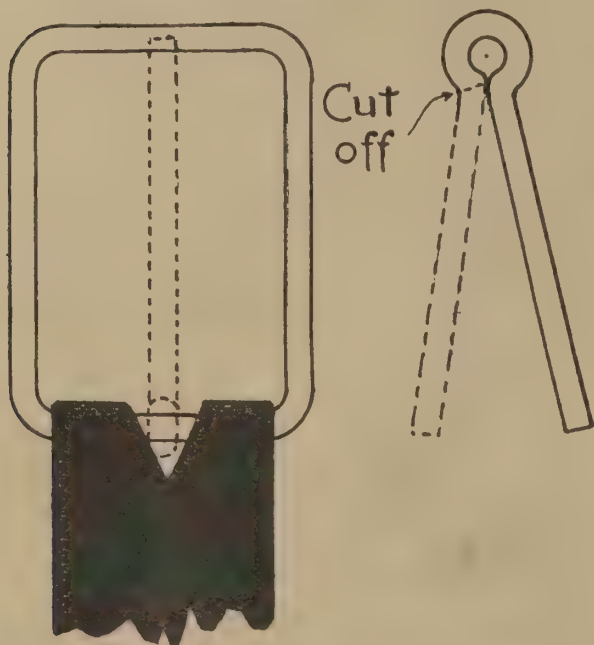
the frame of the hog house door. B a piece of burlap fastened at the top to the door frame and at the bottom to a piece of 2x4. In this way the door may be left open and the hogs go in and out; the 2x4 keeping the burlap in place. The 2x4 is fastened to nothing but the burlap.



Showing Gate-Closing Device in Place and Details of Construction and Operation.

Tongue for Buckle

HAVING several buckles without tongues I tried to repair them with wire but found it very difficult. Some



Tongue for Buckle from a Cotter Pin.

cotter pins were at hand and seeing them gave me the idea that by using one leg with the eye part would give me the tongue.

By using the proper sized cotter a very substantial repair will be the result.

* * *

Easy Springs on Wheelbarrow

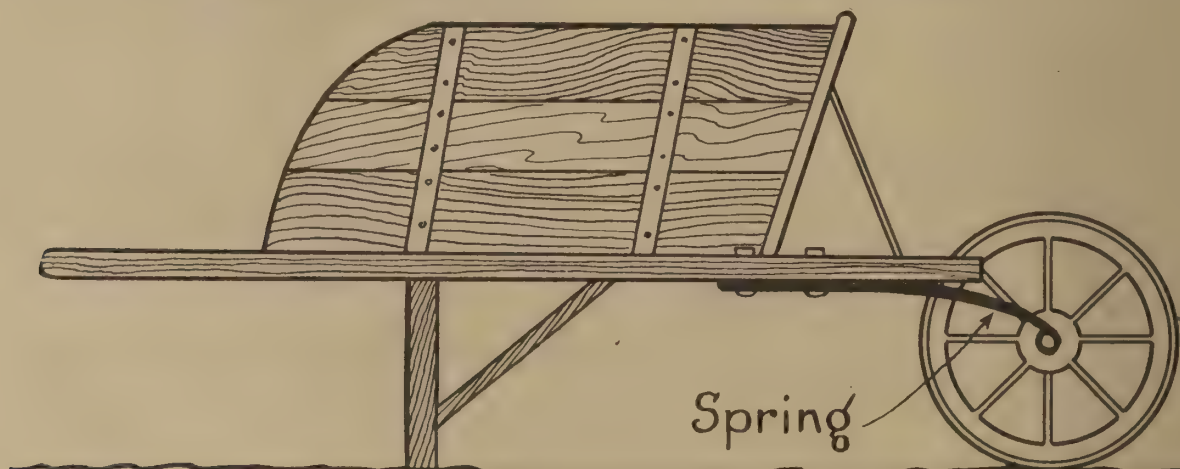
SPRINGS under a wheelbarrow load is something new to me. I saw one

a few days ago that appealed to me as a saver of energy and that can be made at very little extra expense.

In place of the usual holes thru the main handle frames a half of a buggy spring is used. The longest leaf of a spring is necessary because it has the holes thru the ends that serve for the axle boxing. The holes thru the middle of the leaf that are needed to hold the clips on the buggy body are just right to bolt to the frame of the wheelbarrow. One more hole is needed a few inches further in front to keep the spring parallel with the wheelbarrow handle.

This wheelbarrow is especially worth while when using it on a sidewalk or on boards when handling a heavy load. Any of us farmers know what it means to have a loaded wheelbarrow joggling our arms nearly off when running it over a hard track. This prevents that trouble largely.

Under a heavy load the buggy spring will bend up until it strikes the main frame pieces. Because of this there is no broken springs as there might possible be if the spring extended too far in front of the wood support.



A Wheelbarrow with Shock Absorber. An old wagon spring attached as indicated in the drawing takes away the jar and vibration from the handles.

How to Build a Radio Set

Outfit that will receive messages from as far as 1,000 miles can be constructed at small cost by following the directions given in this article

WIRELESS messages are carried on waves in the ether. Ether is all around us, everywhere. Even in a solid stone there is ether, but we cannot see it any more than we can see the air we breathe. When a radio sending station is working it is constantly making waves in the ether around its aerial (as the wires stretched above it are called).

We all know that when a pebble is dropped into a pond of water little waves go out in a circle in every direction, travelling farther and farther until they splash against the banks. Of course there is only one set of waves when a stone is dropped, but suppose we place a cork on the water and start bobbing it up and down. There will be a separate set of waves for each time the cork is bobbed.

Now if another cork is placed at some distance it will bob up and down exactly the same number of times as the first cork and if a person wanted to he could arrange a set of signals and send messages in this way.

In exactly the same way a wireless telephone or wireless telegraph sending station makes waves in the ether, starting them around its aerial, and in exactly the same way the receiving station picks up these waves with its aerial.

The aerial is very simple, but we can readily see that it is very important. Probably most people will consider constructing an aerial the most difficult task they have to do in building their own wireless station. And it certainly makes the explanation of receiving more simple to start at the real beginning of the actual receiving, so it might be wisest to start with the aerial first and explain its construction thoroly.

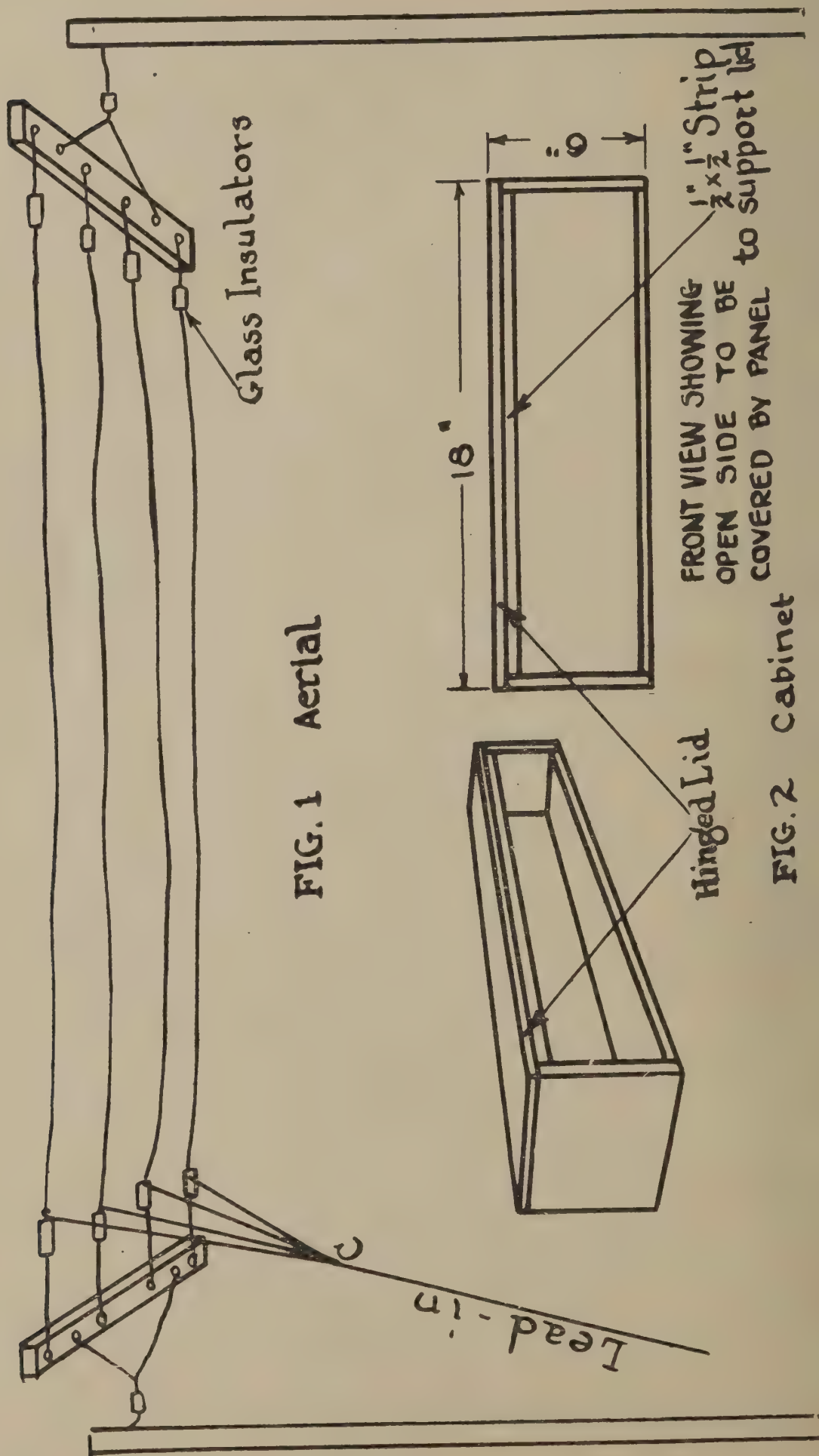
Most any kind of metal will do for an aerial, if it is long enough, providing it is well insulated from the ground. But while constructing an aerial you might as well make a real good one because it will not cost much more and the whole thing costs very little.

An ideal aerial is shown in Fig. 1 and can be made as long as desired (the longer the better, up to 150 feet). It can be placed as high as desired (the higher the better, but it is really only necessary to have it well above most of the surrounding metal contrivances, such as wire fences, metal water tanks, etc.).

In constructing the aerial you may use any size pieces of wood which you may have for the crossarms, such as strips one inch thick, and two or three inches wide. The strips should be long enough to hold as many wires as you want to buy and hold them about $2\frac{1}{2}$ feet apart. Each wire must be connected to a small glass insulator at each end and the glass insulator secured to the crossarm by a short piece of wire as shown. These glass insulators completely insulate the aerial wires from the ground. Another insulator can be used between each crossarm, supporting wire and the wire or rope going to the mast or other support. However, these two insulators are not absolutely necessary.

The size of the wire used should be at least number 14 solid copper, without insulation.

Now as to the number of wires necessary. This all depends upon your pocket-book. One long strand of wire with an insulator at each end makes a fine aerial. However, if you haven't room to stretch such a wire, you can make your aerial shorter and have more wires.



Figs. 1 and 2. Drawing Showing How the Aerial Is Erected and How to Construct the Cabinet of the Radio Set.

Four wires are better than one wire of the same length, but not four times as good as one wire the same length so you can see that it is better to have one wire one hundred feet long than four wires twenty-five feet. Anyone who wants to save money will find that one wire from one hundred to one hundred fifty feet long will give excellent results but if you don't mind the few cents difference it will be well worth your money to have more wires.

It makes no difference in what position you place the aerial, whether level, straight up and down or slanting with one end higher than the other, in fact most any kind of an aerial will work if it is separated by glass insulators from all objects which touch the ground.

As to where to stretch the aerial, any place will do. It can be strung between two poles, or it can have one end fastened to the top of another building and the other to the building in which the instrument is to be placed.

The "Lead In"

A wire must be connected to the end of the aerial nearest the building in which the instrument is to be placed. This wire is called the "lead-in" and must be of at least number 14 bare copper wire and it must be held away from all wood and other objects by glass or porcelain insulators. The best way to insulate this "lead-in" is by boring a small hole thru the wall or window frame and slipping a small porcelain tube clear thru. The "lead-in" can be run thru this tube and fastened directly to one side of the tuner.

If there is more than one wire in the aerial a wire must be run from the "lead-in" to each of them as shown at C in Fig. 1.

The Ground

To make the connections complete a wire the same size as the "lead-in" must be run from the other side of the tuner to the ground.

There are several ways to connect this wire to the ground. Probably if the ground were wet all around you would get results by just sticking the end of it down into the ground. However, it costs nothing to make a good ground connection. If there is a water pipe handy, all that is necessary is to file the pipe clean in one spot, wrap the wire around it tightly and solder securely. The piping goes into the ground and makes a good connection.

A ground connection can also be made by driving an iron rod, or hollow pipe several feet into the ground and soldering the ground wire to that.

Better still, dig a hole as deep as you care to dig and throw several pieces of copper or brass into it, such as the copper bottom of an old worn out wash boiler or similar pieces. Copper wires should first be soldered to each of these and then connected to a cable of copper wires leading up out of the ground. An excellent ground cable can be twisted together from six or eight strands of the same size wire as that used for the aerial. All connections should be scraped clean and soldered securely.

After all the connections are made with the ground plates the dirt may be thrown in again and packed down tightly. The wetter the ground is kept around this spot the better the ground connection will be.

While not in use the "lead-in" from the aerial should be connected directly with the ground wire outside the building. The construction of a handy switch for making and breaking this connection will be described later. When connected properly to the ground during a thunder-storm an aerial is a better protection to the surrounding property than lightning rods.

According to the writer's opinion when the aerial and ground have been constructed the hardest task of all has been finished.

Next we will take up the making of

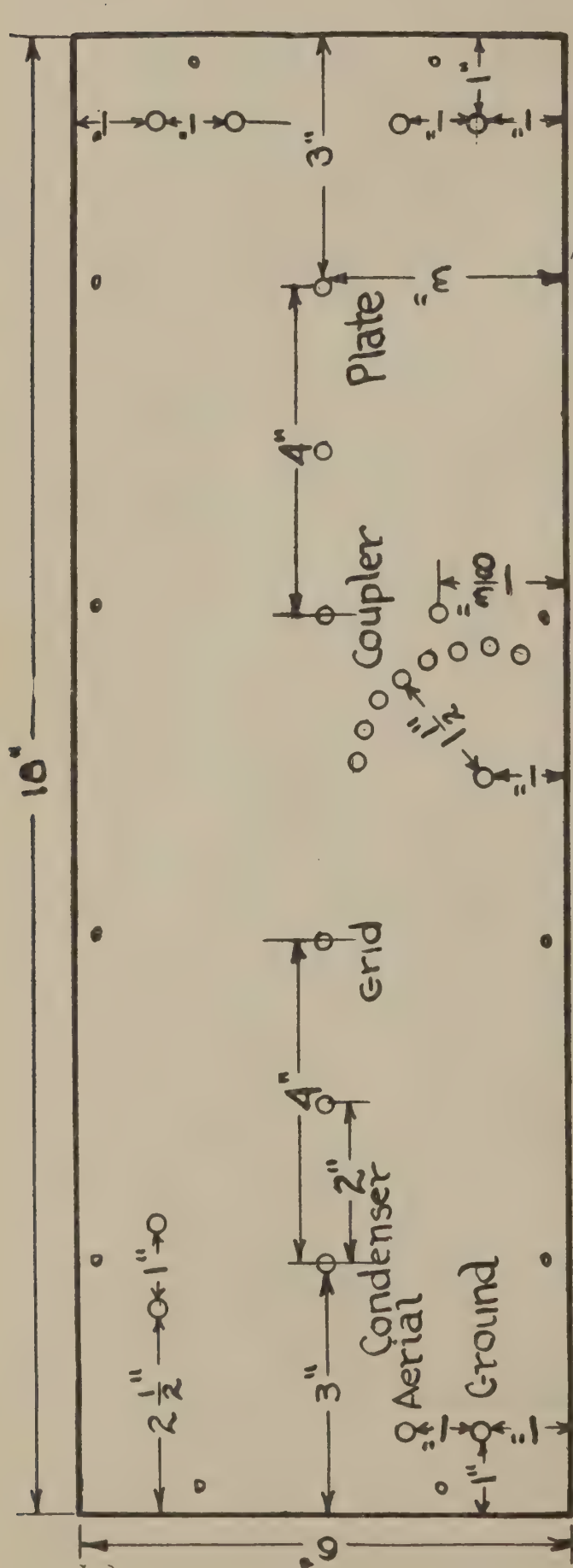


Fig. 3. Drawing Showing How and Where the Various Parts of the Apparatus Are Installed in the Cabinet.

the tuner. After all, the tuner is only a device for adding more wire onto your aerial or taking some off. It is possible to receive wireless messages without a tuner, but without a tuner you would have to climb up to your aerial and take off or put on wire each time you wanted to listen to a different sending station. Because, to hear a certain station, your aerial must be, in effect, exactly the same length as the aerial sending. With a tuner this is accomplished by merely turning a knob.

The Cabinet

With a little care a beautiful cabinet can be made and stained oak or mahogany to match the nicest of furniture. There is nothing much to say about the actual construction of the cabinet as each individual will have his own idea. The wood used does not matter (pieces from an old apple box take a nice finish after being sand-papered off smooth).

When completed, the cabinet should be exactly 18 inches long over all and 6 inches high, measuring from the top edge of the lid to the bottom edge of the sides. These dimensions are necessary so the panel, which covers the open side shown in Fig. 2, will fit even with the outer edges of the cabinet. The cabinet's width should be about $\frac{1}{8}$ inch less than 6 inches, so that when the panel is placed over the open side the width of the cabinet (panel and all) will be 6 inches. A hinged lid should be provided as you will want to show the working parts of your set to your friends. The bottom of the cabinet should be made of a board not over $\frac{3}{8}$ inch thick for a reason which will be understood later. Across the open side run a $\frac{1}{2}$ by $\frac{1}{4}$ inch strip so the lid, when closed, will rest against it.

The Panel

This should be 18 inches long, 6 inches wide and of a thickness anywhere between $\frac{1}{8}$ and $\frac{1}{4}$ of an inch.

For the best results it should be made

of some manufactured insulating material such as bakelite, but real dry wood will do. When wood is used it should be covered with two or three coats of shellac after all the holes have been drilled.

There is nothing to be done to the panel except drilling the holes. All holes should be $\frac{1}{8}$ inch in a diameter except the 12 small holes along the edges. These are drilled just large enough to take the $\frac{3}{4}$ inch shaft of the wood screws which hold the panel in place.

In marking off the panel for the $\frac{1}{8}$ inch holes for the switch points first draw part of a circle with a drawing compass and drill the holes so that they will be $\frac{3}{8}$ inch apart from center to center and so they will all be $1\frac{1}{2}$ inches from the center of the switch.

The Base

A base 16 inches by 5 inches by $\frac{1}{4}$ inch can be cut from any kind of wood and fastened along one edge to the bottom part of the panel by means of small brass screws inserted thru the four small holes along the bottom of the panel. This piece forms a shelf on which some of the parts are fastened.

The Coils

For long distance receiving there are six coils used. Now for holding these coils of wire in place there are many styles of holders or forms used and they are all good, but for the benefit of those who want to save money we will resort to the old reliable form—the cardboard cylinder.

To make these forms you will need two hollow cardboard tubes about 6 inches long. One of these tubes must be 4 inches in outside diameter and the other 3 inches in outside diameter. You can make these yourself if you care to go to the trouble, or you can buy them ready made in any length desired for a few cents.

For the benefit of those who must save

every cent possible in order to be able to afford a wireless set it can be said that the two tubes may be made in the following way.

Procure two glass preserve jars, bottles or round boxes over 6 inches in length and of different sizes. The small one should be $2\frac{3}{4}$ inches or less in diameter while the larger should be $3\frac{3}{4}$ inches or less in diameter. If slightly smaller than the diameters the jars must be made exactly the diameter given by winding on a few turns of strong paper and gluing it in place. The tubes can be made by winding stiff, brown, wrapping paper or other good paper around the jars until a thickness of exactly $\frac{1}{8}$ inch is reached. This paper should be pasted on as it is wound, leaving only the outside and inside surfaces free from glue. Care must be taken not to get glue between the form and the first layer of the tubes as the tubes, when dry, must slip freely from the forms.

When dry the tubes may be cut into the desired lengths by first marking straight pencil lines around the tubes and running the corner of a sharp safety razor blade along them again and again until it cuts clear thru. The large tube must be cut into three parts, the first of which is $2\frac{1}{4}$ inches wide and the other two pieces are $1\frac{5}{8}$ inches wide. From the small tube is cut three pieces, each $1\frac{5}{8}$ inches wide.

Into the large $2\frac{1}{4}$ -inch ring there must be three slots cut directly opposite each other as shown in Fig. 4-A. These slots should be exactly $\frac{1}{2}$ inch deep and $\frac{1}{8}$ inch wide. Into each of the other rings there must be two $\frac{1}{8}$ -inch holes drilled directly opposite each other and equal distance from the edges as shown in Fig. 4-B.

Winding The Coils

Each of the cardboard rings must be wound with No. 26 S. C. C. (single cotton covered) copper wire. This will require about 300 feet of this

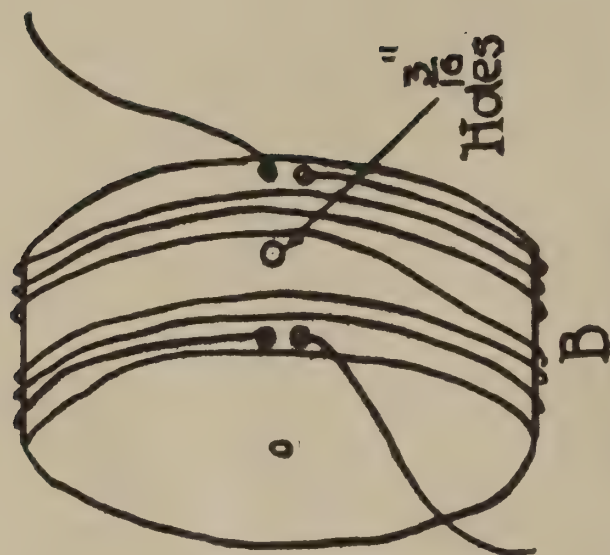
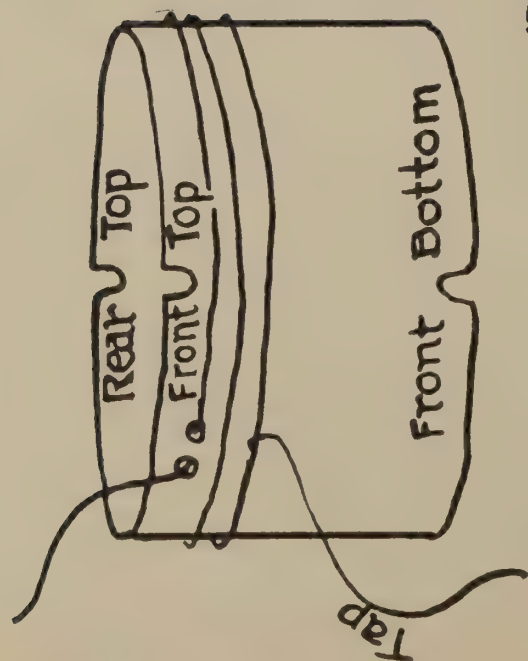


FIG. 4. Coils

A

Fig. 4. Showing How to Make and Wind the Coils of the Radio Set.



wire, or $\frac{1}{4}$ pound.

To simplify matters and to make it easier for anyone who happens to be a beginner, we shall start at the real beginning of these coils and give their "radio" names and explain their action as we go on with our construction.

The first coil to come into action when receiving a message is the large one and to the radio-wise this is known as the vario-coupler stator. The name stator is given because this part is stationary and does not move. Why it is called a vario-coupler can be better understood later.

The edge of this ring which has the two slots opposite each other should be labeled "top" and the side which has the one slot below the other should be labeled "front" to simplify the explanation. (See Fig. 4-A.)

This is the only difficult coil to wind, so great care must be taken. To start, punch two pinholes thru the tube and about one-quarter inch apart in the front side and in a direct line with the lower edge of the top slot. These pinholes should be about two inches to the left of the slot. The end of the copper wire, cotton covering and all, should now be run down thru the pinhole nearest the slot and up again thru the other pinhole, leaving about four inches for connecting purposes. Wind to the right, always, unless otherwise specified.

After two turns have been wound on, carefully remove the insulation from $\frac{3}{4}$ inch of the wire and wrap on a piece of the same size wire from which all the insulation has been removed. This piece is wrapped round and round the bare place on the wire until the whole bare spot has been covered. Wind it smooth and even—do not stack it. The loose end which is about four inches long, should leave the main wire about one-eighth inch to the right of the first pinhole. The winding can be continued after running a cigarette paper under the

bare spot to separate it from the wires on either side.

This lead-off is called a "tap" and similar taps should be made at the end of the fourth, sixth, twelfth, eighteenth, thirtieth and forty-second turn. Each time the loose end should leave the main winding about one-eighth inch to the right of the preceding tap. This is called staggering the taps and it keeps the loose ends better separated.

After the fifty-fourth turn is on, if you have put the wire on evenly, the edge of the winding should be just about even with the upper edge of the lower slot. This end should be anchored thru pinholes the same as at the start, leaving about four inches of loose wire for connections.

This coil is so constructed and connected that the wireless waves, which are caught by your aerial start at the top end of the wire which you have just wound and travel round and round the coil, finally departing from the coil thru any one of the loose ends of the wire which you may choose to touch against the wire which leads from your instrument down into the ground. This coil is for changing the length of your aerial and enables you to add on several feet of wire to your aerial so that it will be, in effect, the same length as the effective aerial which the broad-casting station is using, or, in other words, in tune. By touching the top tap to the ground you have a very short aerial and by touching the bottom tap to the ground you have a very long aerial, and so on.

Of course we don't want to stand and hold these wires against the ground wire all the time so we employ a simple device called a switch to do it for us. This will be described later.

The Vario-Coupler Rotor

Next let us wind the rotor or revolving part of the coupler. For this one of the small rings is used and fifty turns of wire is wound on, starting by anchoring

$\frac{1}{8}$ inch from one edge, winding on twenty-five turns, skipping over $\frac{1}{4}$ of an inch to miss the $\frac{1}{8}$ -inch holes and applying another twenty-five turns. The start should be even with the start and should holes drilled in the side and the finish, should be even with the start and should be about one-eighth inch from the edge. A third pinhole should be punched on each side of this coil about one-eighth inch from the others and the loose ends of the wires should be run thru these toward the inside of the ring and left extending about four inches for connections.

When the wireless waves from the aerial are whirling around the stator windings of the coupler, they create or set up a region or field of influence for several inches around in every direction. This influence is called magnetism, and the field of influence is called a magnetic field. Now, if another coil is placed inside this there will be waves set up in the small coil similar to the ones in the larger coil.

This influence of the large coil over the smaller one can be varied or changed by rotating the small coil within the larger and for this reason the small coil is made so it will rotate.

The Variometers

The other four coils are wound in exactly the same way as the coupler rotor, having fifty turns of wire each. The only difference is that on the large coils the ends of the windings are left turned outward instead of projecting thru a third pinhole toward the inside of the coil as they do in the small coils.

After all the coils have been wound each must be given a very thin coating of shellac and dried thoroly in a warm (not hot) oven.

Mounting the Coils

The coils are all mounted or set up in pairs as shown in Figure 5-A and use three $\frac{1}{8}$ -inch wooden dowels or small round pieces of wood (each 6 inches

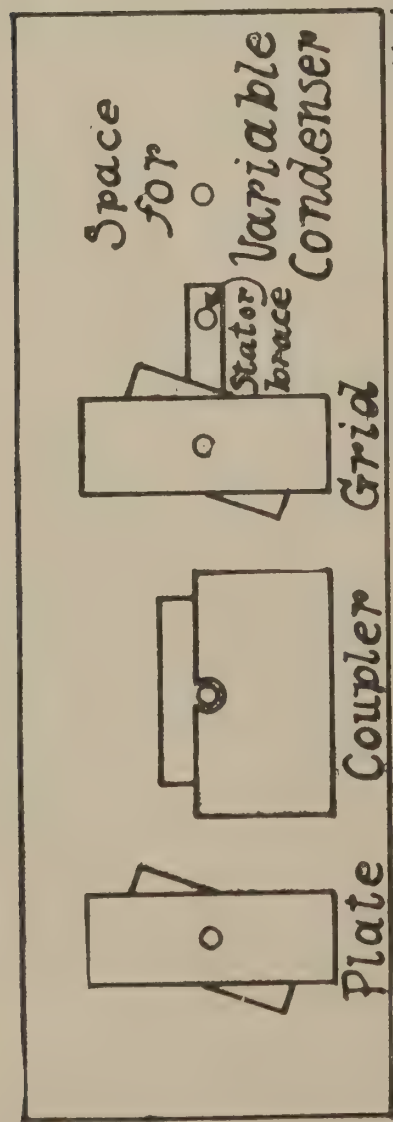


Figure 5-A Rear of panel, showing arrangement of coils

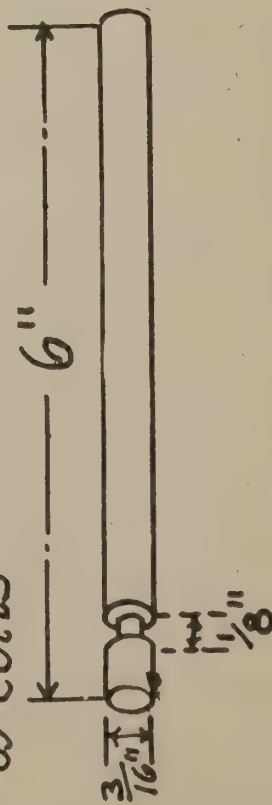
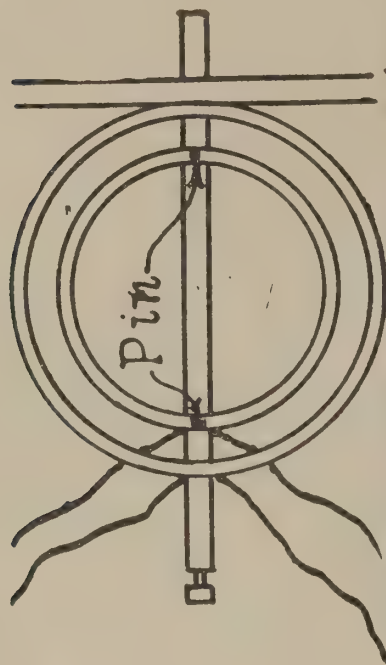


Fig. 5. C-Notched wooden axle



Notice the two ordinary brass pins pushed down between the layers of paper ring into wooden axle Fig. 5, B-Mounting the coils See Fig. 7.

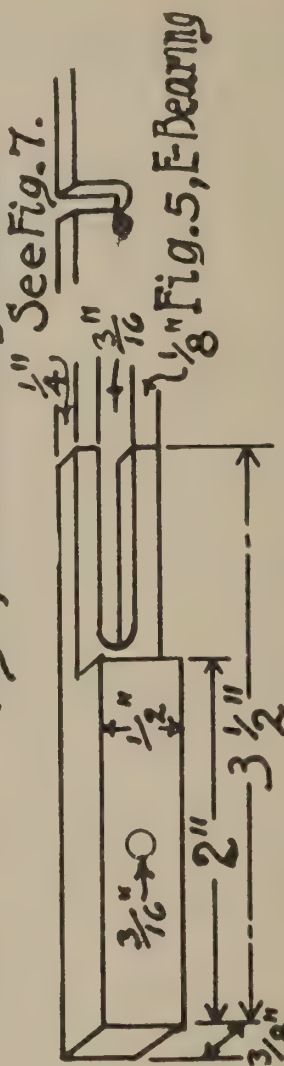


Fig. 5. D-Variometer stator brace

Drawings Showing How to Make and Wind the Coils and the Way They Should be Installed in the Radio Outfit.

long) for shafts. Each pair of coils is placed on one of these little axles as shown in Figure 5-B so that all the loose connecting ends of the coils are towards the rear end of the axles. The front ends of these dowels extend thru the panel five-eighths of an inch. Each shaft is provided at the rear end with a little notch cut all the way round and allowed to turn in a wooden support which just fits into this notch.

The dimensions used in cutting these notches in the shafts are shown in Figure 5-C and the making of the supports will be described in detail later.

The vario-coupler stator (the large coil with the taps) is slipped up under its rotor so that the top slot at the front slides around the axle. The stator is held in place by a brass bolt and nut extending thru the panel and lower slot. The rear end of the dowel on which the vario-coupler rotor is placed will now fit down into the $\frac{3}{8}$ -inch slot cut in the back side of the stator and should rest on the bottom of this slot.

The two variometer stators (or large coils) are held in place by small slotted wooden pieces shaped something like D in Figure 5. These pieces are secured to the panel by small brass bolts and nuts—the heads of the bolts projecting thru the holes drilled for them in the panel.

The rotor tubes should fit onto the axles real tightly so they will not slip, but the axle must turn freely in the stator tube. If the two holes in the rotor tube fit snugly it will not be necessary to fasten the rotor to the axle, but if these holes fit loosely the rotor will have to be fastened to the axle by two ordinary pins pushed down between the layers of the paper ring and to the wooden pin as shown in Figure 5-B.

The Axle Support

A suitable support is required to hold the rear ends of the axle steady. This part can be whittled from a $\frac{1}{4}$ -inch board and shaped as shown in Figure 7.

The slots should be made to exactly fit the notches in the wooden axles. Small brass wood screws and brass washers are placed as shown. These are to be used for binding posts in connecting the loose ends of the coils. The dimensions for the support are all shown in Figure 7 except its height. The height of the support, of course, depends upon the thickness of the base used. To determine this dimension measure from the base upward to the holes drilled in the panel for the front end of the axles. Both ends of the axle must be, of course, held level or the dials on the front of the panel cannot be turned.

Connecting the Coils

The Vario-coupler Stator—The upper end of this coil is connected to the binding post marked "aerial" in Figure 3. Each one of the taps is connected in the order to switch points placed in the little row of holes which were drilled to receive them. The first tap goes to the top point, the second tap to the next and so on. Make sure these wires are not touching each other anywhere.

The Rotors

The Rotors—The loose ends of the rotor windings must be gotten out thru the holes in both the rotor and stator tubes along with the axles. To do this a small groove may be scratched deep enough into the dowel along its opposite sides so that a wire may be imbedded into each deeply enough that it will not rub against the tube where it goes thru the holes. To hold these wires down into the grooves a sewing thread should be wrapped around the axle a short distance from the notch. This will hold the wires in place as the rotor is being turned. See Figure 6.

Connecting the Variometers

One of the wires leading from each of the variometer rotors must be connected to either of the wires leading back to its own stator. This leaves two

loose ends on each of the three pairs of coils. (The ends of the rotor windings should be fastened to the brass screws on the notched axle support, leaving play enough to allow at least half a turn to the rotor.)

Either one of the loose or disconnected ends of the vario-coupler rotor (which now happens to be the brass screws) should be connected to the top binding post in the right-hand end of the panel. The other end of the vario-coupler rotor should be connected to the loose end of the stator winding of the variometer marked "Grid." The loose end of this grid variometer rotor winding is connected to the second binding post from the top.

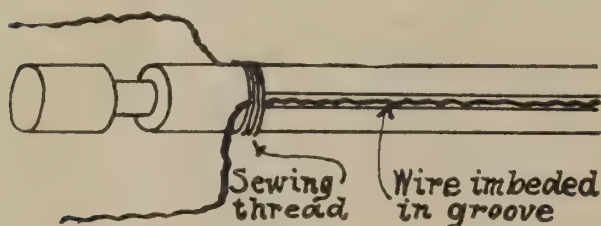


Fig. 6

Showing How to Hold the Wires in Place.

The binding screw leading from the stator of the plate variometer is connected to the bottom post in the right-hand end of the panel, and the loose end of the rotor to the next post.

This just about completes the work of the amateur on the tuner, as the remainder of the parts should be purchased ready made. The condenser which is used in tuning can be bought very reasonably and is all ready to be attached to the base or panel as desired. The dials which beautify the set very much are also reasonable in price and very hard to make. Plain little knobs and pointers can be used. The switch can be bought for a few cents and is also very hard to make.

The Dial

For the benefit of those who desire a beautiful set and haven't the money to

spend on dials, a working idea for the construction of these parts will be given.

Four discs of wood about three-sixteenths of an inch in thickness and two and one-quarter inches in diameter should be cut and beveled neatly around the edge on the front side.

This disc should have a $\frac{3}{8}$ -inch hole drilled thru its center so it will fit snugly onto the projecting end of the shaft.

The beveled edges should have calibrations or notches cut into them something similar to the markings on a beveled ruler. Readings are taken from these markings by comparing with a similar line or mark on the panel. To make the markings more clearly visible the notches can be filled with white enamel. This filling should be put in before varnish or shellac is applied, as the varnish cannot be scraped from these places after it is dry. A thin paper washer slightly smaller than the dial should be slipped on between the panel and dial.

Now a ring of wood seven-eighths of an inch in diameter and one-quarter of an inch in thickness must be whittled out and fitted snugly on the axle and fastened to the dial with pins. The projecting end of the dowel should now be cut off even with the outer edge of this circular wooden ring and a small disc three-sixteenths of an inch thick and $1\frac{1}{8}$ inch in diameter can be fastened to the wooden ring.

When this is finished the dial can be fastened securely to the axle by running a pin down thru the wooden disc and into the dowel. (Figure 8 shows a complete dial and knob.)

The Switch

This part can be made by fastening a strip of springy brass to a wooden knob of the same size and shape as that used for the dials. The brass strip used must be long enough to press firmly against the switch points as it swings around. The brass strip with the knob is held tightly against a brass washer which

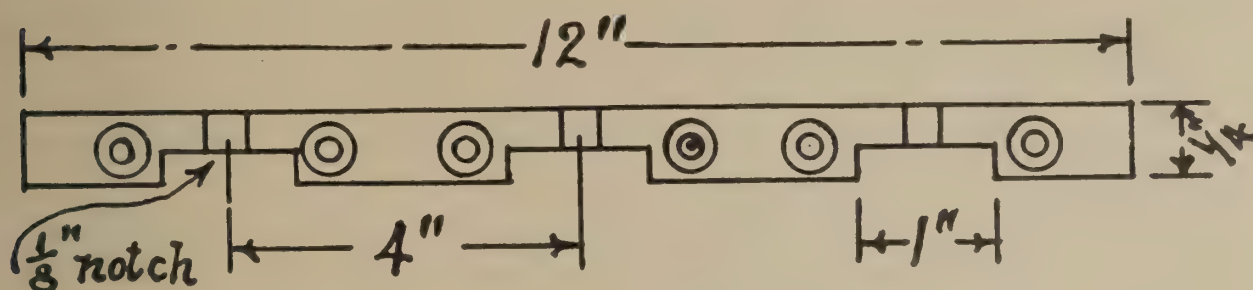


Fig. 7, Notched axle support

Support for the Axle of the Coils with the Dimensions it Should be Made.

rests against the panel. The whole is held firmly in place by a long brass bolt. This bolt should be run thru a hole in the large end of the spring before it is fastened to the knob. On the inside of the panel a small coil spring is slipped over this bolt and the nut screwed on and fastened. (Figure 9 gives an idea of how the switch should be assembled.)

Completing the Connections

The connections are completed when the bolt in the center of the switch is connected to the binding post marked "Ground."

The variable condenser is used in tuning. Very little need be said about this part, as it is best to buy it complete or at least the manufactured parts ready to be assembled.

Any type of variable condenser will do, if it has a maximum capacity of about .001 mfd. (one thousandth of a microfarad) and there is nothing difficult about attaching a condenser to the set as they are provided with means for attaching them to either the panel or the base of the cabinet.

With the tuner we have already described there is used a separate detector cabinet in which the detector and amplifier bulbs and their controls are housed. The cabinet itself is made exactly like the tuner cabinet and of the same dimensions. It should be stained to match the tuner cabinet.

The Detector Panel

The detector panel should be of the same material as the tuner panel. For the best results bakelite or some similar insulating material should be used, but a thin, dry, wooden board will answer the purpose. When a board is used

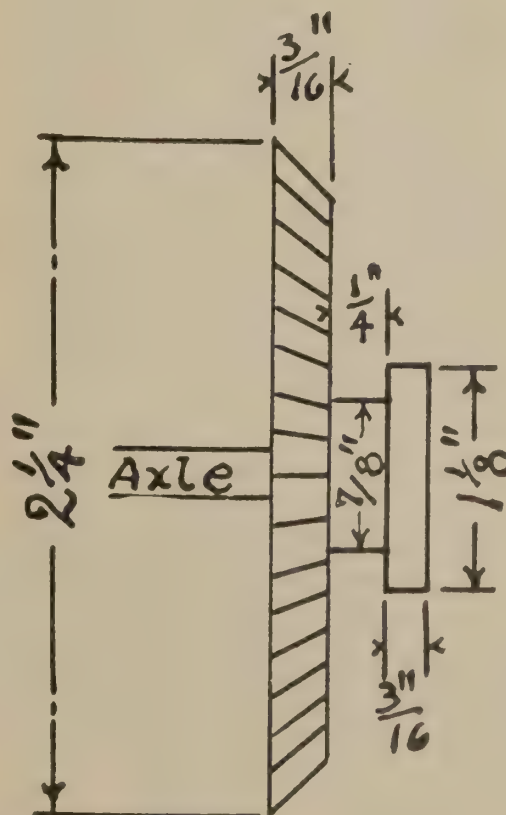


Fig. 8, Knob and dial

Complete Knob and Dial.

for a panel (especially if this board is varnished or stained) all the binding posts and other metal parts which are in any way connected with an electric current should be well insulated from the panel. The best way to do this is by cutting washers from dry cardboard and placing one on each side of the panel where the metal parts go thru. These washers can be cut just to fit the metal part and in this way the metal is held away from the varnished wood and at the same time the cardboard does not mar the appearance of the panel. To further insulate these parts wind silk sewing thread around all pieces which go thru the panels, completely covering the metal so it cannot touch the wood.

There is nothing complicated or hard about making the detector panel and nothing more need be said about it as all that is necessary is to mark off the material and drill the holes as shown in Figure 10.

The three clusters of holes near the top of the panel (shown seven in a group) may be omitted as they are not at all essential. They are there to beautify the instrument and to be used as peepholes thru which the brightness of the lamps may be watched. The bright-

ness of the lamps can be watched just as well by raising the lid. However, when neatly countersunk, these holes help the appearance of the set greatly.

The Base

A shelf made of a thin board about 17 inches long and $5\frac{1}{2}$ inches wide should be fastened to the back of the panel so it will just slide into the cabinet and rest flat on the bottom when the panel is fitted into place.

Assembling the Panel Parts

Figure 11 shows the panel and base both as if they were knocked down flat. This makes a very simple wiring diagram possible.

Three rheostats, having a capacity of $1\frac{1}{2}$ amperes and a resistance of about 6 ohms, should be arranged as shown. Probably a few extra holes will have to be drilled in the panel to receive the bolts which are to hold these in place. The rheostats are for controlling the brightness of the bulbs.

Two 5-spring and one 3-spring filament control jacks are attached to the panel as shown. Before putting these in place the little connecting ends should be bent out in fanlike shape as shown, in order to make the soldering of connections easier.

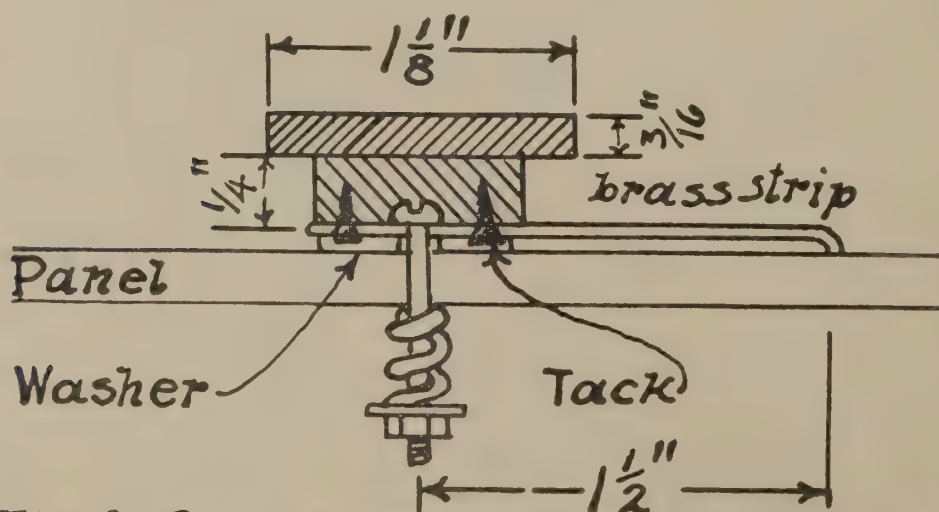


Fig. 9, Cross section of switch showing how knob and bolt are joined to brass strip

If you are not handy with a soldering iron, you might find it a little hard to solder wires to these jacks after they are fastened into place. A good stunt to overcome this difficulty is to solder a short piece of No. 14 bare copper wire to each of the little prongs of the jacks before fastening the jacks into place. These pieces of wire can be left projecting about two inches, spread out in fanlike shape. This allows ample room for soldering the connecting wires in place.

Another little stunt to make it easier for the fellow who doesn't happen to be handy with the soldering iron is to take the jack apart before soldering the short pieces of wire to its prongs. But, by all means, before taking the jack apart make a very accurate drawing of it or you will forget how it was put together. Take the top spring of the jack and after scraping the prong and one of the short pieces of wire real clean bind the piece of wire to the prong with about three turns of No. 26 bare copper wire. This will hold the pieces together while they are being soldered. As each part is soldered slip it into place, building up the jack as you go, but being sure that the wires do not touch each other.

If you should tear the small pieces of waxed tubing which surround the little bolts holding the springs together you can roll strips of paper around the bolts in place of the waxed tubing.

A grid condenser of .00025 mfd. capacity is arranged as shown.

An adjustable grid leak can be bought to fit the condenser or it can be made. The making of this part is very simple as all that is necessary is to cut a piece of thick, dry cardboard to the size and shape shown in Figure 12. The leak is made by drawing a lead pencil mark between the two holes. Two 3/32-inch brass bolts are pushed thru the holes so the heads fit up tight against the ends of the pencil mark. The same bolts

hold the condenser in place. The grid leak is adjusted by erasing part of the pencil line or putting on more.

Eight nickel plated binding posts complete the parts to be assembled on the panel.

Assembling the Parts on the Base

Three tube sockets are arranged on the base so the markings on their binding posts appear in exactly the order shown.

Two transformers may be placed in any handy space as all that is necessary is that they should not both point in the same direction.

In buying the transformers the constructor can use his own judgment as to the ratio between the primary and secondary windings. The higher the ratio the louder the signals, but if too high a ratio is used on No. 2 the signals may be somewhat distorted. About the best arrangement is a 10 to 1 transformer for No. 1 and a 5 to 1 for No. 2.

Wiring the Parts

The wiring of a detector cabinet is generally the hardest and most complicated part about making a radio set, but with the simple arrangement in Figure 11 it is made one of the easiest tasks of all. For the wiring 1/2 pound of No. 18 insulated copper bell wire will have to be obtained.

To begin with, two pieces of this wire must be attached to the binding posts in the upper left hand corner of the panel, after having scraped the insulation from small sections as shown.

Now you will find that there are 32 sets of numbers (two numbers to a set.) Each number represents a point where a connection must be made. If one point has two numbers, that simply means that there are to be two wires connected to that point.

The surest way is to take the gummed flap of an unused envelope and cut the glue covered portion into 64 small

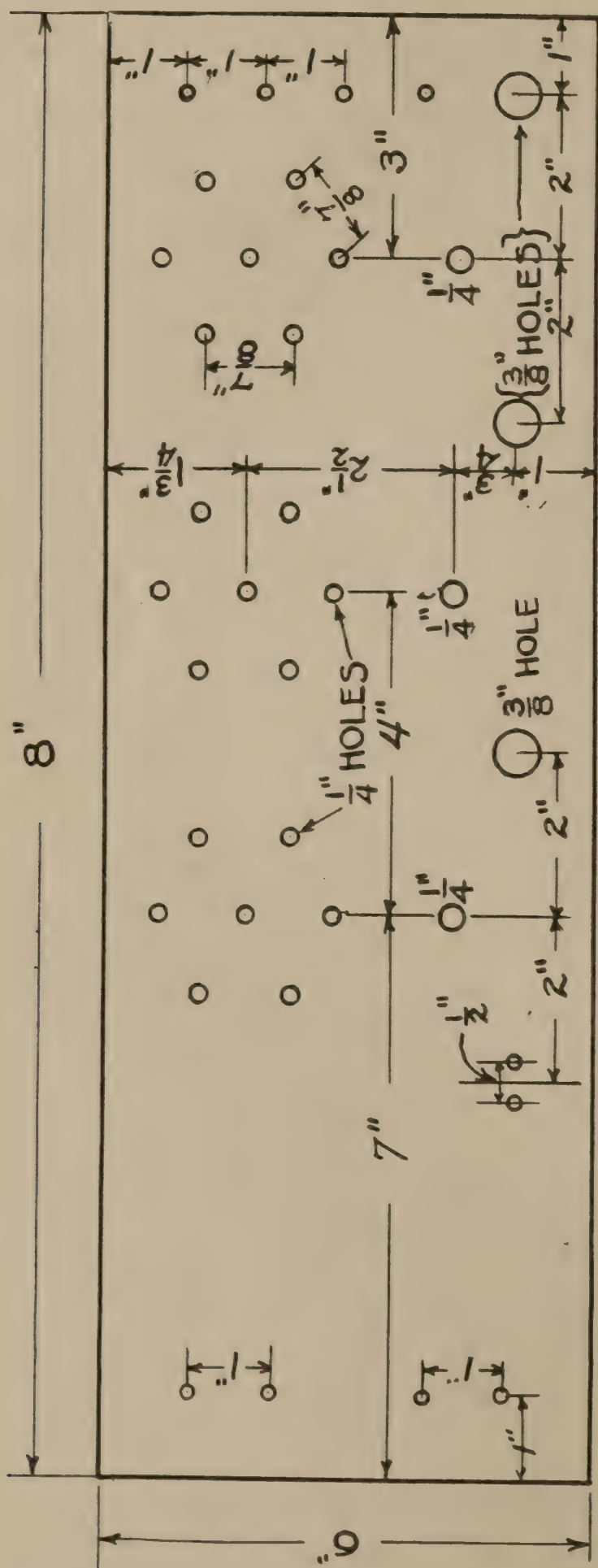


FIG. 10 Detector Panel

Drawing Showing the Location of the Holes and Their Sizes That Are to Be Bored in the Detector Panel.

squares and after dividing them into pairs number each pair with numbers from 1 up to 32. Number all connecting points exactly as shown in Figure 11 by pasting these stickers beside them.

All that remains to be done is to cut 32 pieces of different lengths from the No. 18 copper bell wire and, after removing the insulation from small portions of each end, connect all like numbers. Begin by connecting No. 1 to No. 1, No. 2 to No. 2 and so on. If a single point has two numbers beside it as in the case of the post labeled 8 and 9, simply connect two wires to this point and run one to No. 8 and the other to No. 9, or whatever numbers are shown.

All connections made to points other than binding posts should be securely soldered.

The "A" Battery

For lighting the filaments in the tubes a six-volt battery will be needed. An automobile storage battery will do. It should be attached to the instrument as shown in Figure 13.

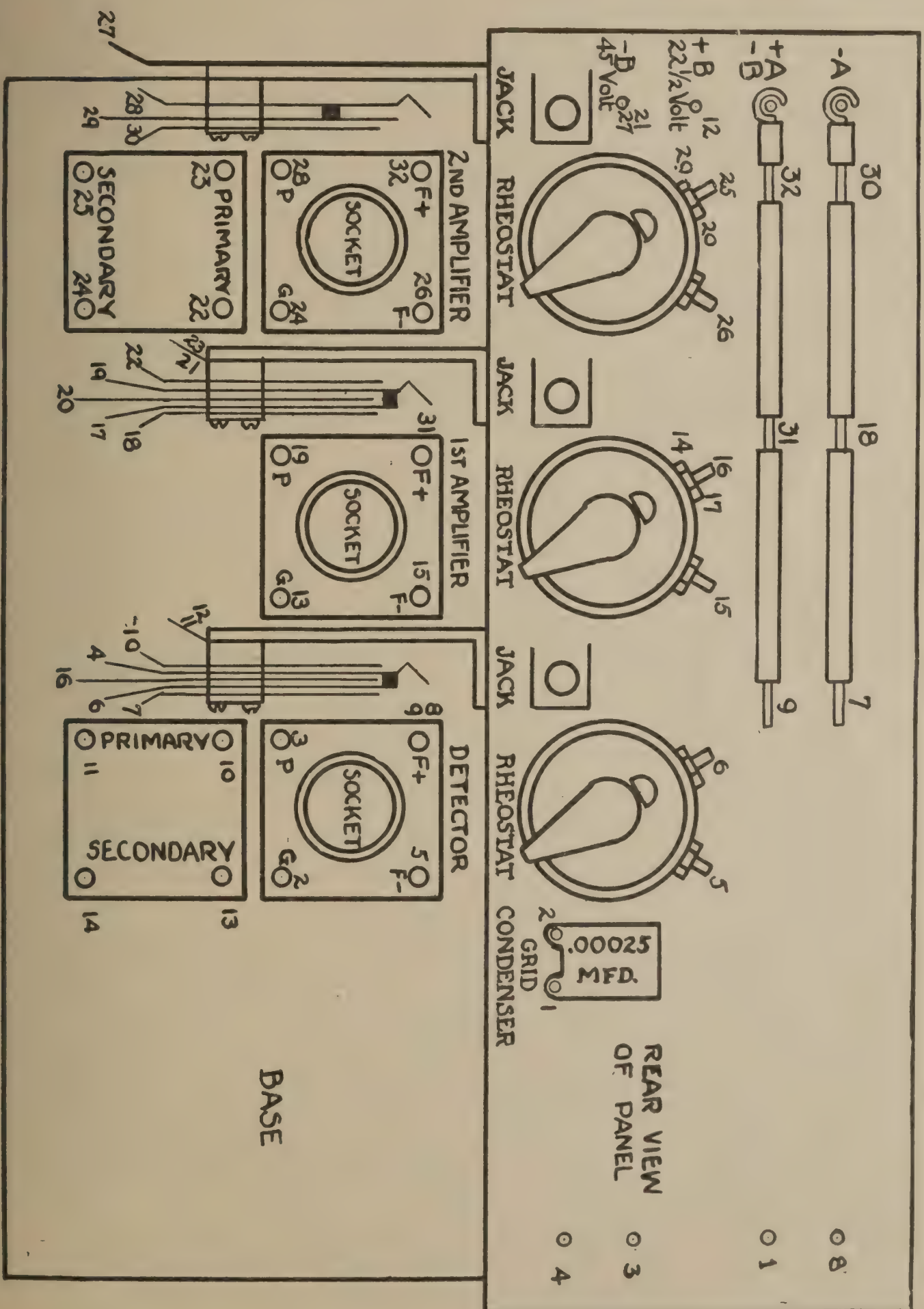


Fig. 11. Wiring Diagram Showing How the Wires Are to Be Connected by Attaching Each Numbered Wire to

The Detector "B" Battery

A high voltage battery, commonly called a "B" battery, is attached to the set as shown in Figure 13. This battery should have a total voltage of $22\frac{1}{2}$ and should be provided with means for tapping in at a lower voltage if desired. This battery should have the taps at lower voltages because different detector tubes will be found to work better at

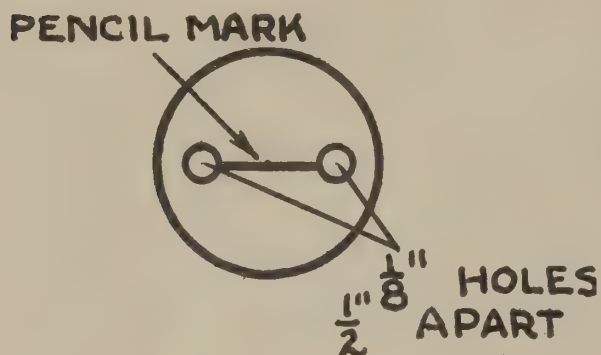


FIG.12 Grid Leak

Diagram Showing How to Construct the Grid Leak.

different voltages between 18 and $22\frac{1}{2}$, and until you have experimented with your detector you don't know at what voltage it will work best.

The Amplifier "B" Battery

For the amplifier a "B" battery of 45 volts is used, connected as shown

in Figure 13. To make the signals still louder a voltage up to 70 can be used for the amplifiers but the connection shown furnishes all the voltage necessary.

Lightning Protection

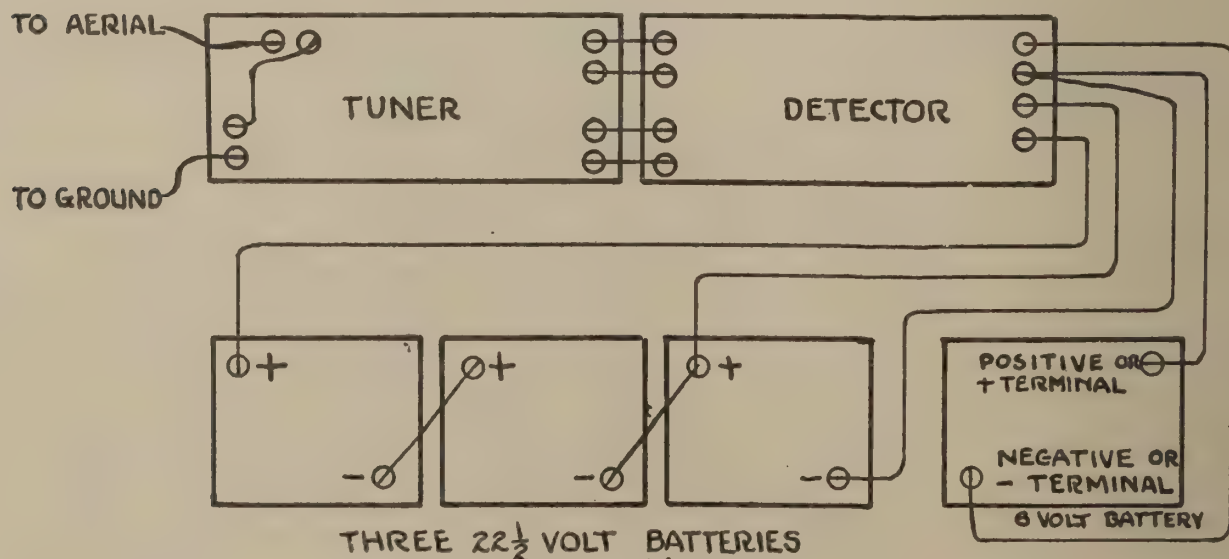
It is advisable to have a heavy knife switch placed outside a window in an easily accessible place. This switch should be mounted in a vertical position and connected as shown in Figure 14. When the instrument is in use the switch should be thrown into the position shown in Figure 14, but at all times when the set is not in use the lever should be thrown over and pressed down, thus grounding the aerial outside the building.

It is also advisable to equip an aerial with a patented lightning arrester. These various contrivances are furnished with directions for installing so space will not be taken here to explain their installation.

Solder All Connections

Remember, if you want your radio set to work, solder each and every connection which is not made to a binding post or binding screw. Do not, under any conditions, fail to do this.

Also before making each connection, whether it is to be soldered or not, scrape the ends of wire or other parts



THREE $22\frac{1}{2}$ VOLT BATTERIES

Fig.13 Connecting the Set

Showing How the Batteries Are Connected Up.

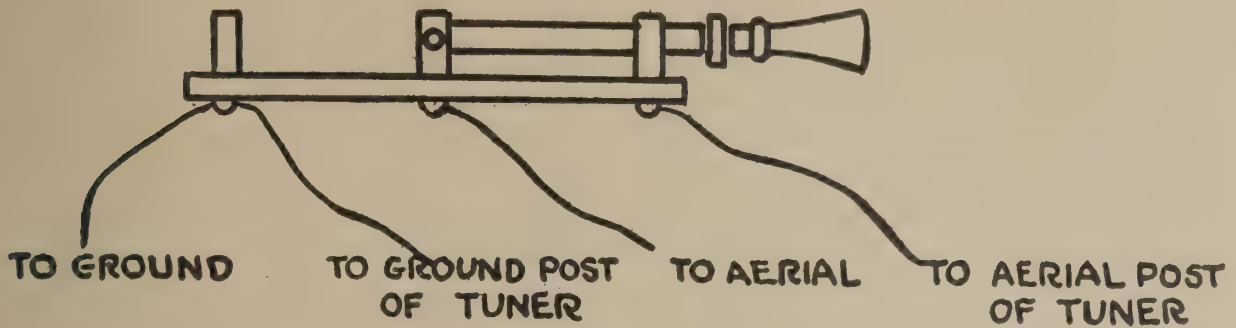


FIG. 14. Ground Switch

Lightning Switch and Arrester with Which All Radio Sets Should Be Equipped.

which are to be connected real clean before making the connection; and make each connection real firm and rigid or you will have a set which will not work and you will be wondering what is wrong with it.

Selecting Parts

A few words should be said concerning the selecting and buying of the parts which cannot be made by hand. For in this way the inexperienced constructor can be given advantage of the experience of others.

First of all and above all things be very particular about what kind of phones you buy. The phones you must remember, are the very life of a set and much depends upon the sensitiveness of them. They should have two earpieces so as to exclude all interfering noises and they should be about 3000 ohms resistance. Such sets are advertised as supersensitive, meaning extra sensitive, and retail at about \$6 and up.

A plug will have to be purchased to fit the jacks used. This plug clamps the tips of the receiver cords and makes it possible to "plug in" on one, two or three bulbs. The bulbs which are not in use are automatically switched off by the jacks and thereby current is saved.

When plugging in on one bulb after using two or three always dim the lights slightly by turning the rheostats so that the one bulb will not be injured by receiving too much current.

The six-volt "A" battery or filament lighting battery should be of a standard make and should have a capacity of at least 80 amperes or more. The greater the capacity the better, as it will not run down so often. This battery should never be allowed to run down so that it will not operate at least two bulbs.

Some provision will have to be made for having this battery recharged and the recharging of this battery practically constitutes the operating expense of the set.

The high voltage or "B" batteries should be of a standard make and they use so little current that they will function properly for months without having to be replaced.

How to Use the Set

If you find that your set has something wrong with it do not feel discouraged, because we will get around to your assistance in our next issue of this article. Space in this issue will be limited to those who are correct in all their construction from the very first as it would not be fair to hold back the enjoyment and pleasure from those who have their sets all ready while we go "trouble shooting" for a few days.

The writer has undertaken to place the enjoyment of radio within the grasp of those of his readers who cannot afford to pay a high price for a factory made receiving set. This is a great service which cannot be fully appreciated by its readers until they begin receiving

concerts, news, weather reports, etc., right in their own homes.

It is the writer's desire that not a single person who carefully builds this set should be disappointed so a scheme is herewith given by which anyone who has made a mistake in wiring can check over his work in search of his own error.

After a broadcasting station has been heard a few times it is not hard for the operator to tune in this station again because he can remember just about how his controls were set.

In tuning, first plug in the phones then turn the rheostats slowly until the bulbs burn brightly, but not dazzlingly so.

Then turn your attention to the tuner. First try the switch on the lowest point, manipulating the condenser back and forth. Also try varying the vario-coupler and the variometers but do not turn them clear round as this would twist off the connecting wires. They are designed to make only a quarter turn each way then back. Most messages are received with the vario-coupler and variometer rotors almost straight in line with their stators and not crosswise.

If no sound is received try the switch on the next point and repeat the manipulation of the controls, and so on.

Another thing which adds to the difficulty of tuning for the first time is the adjustment of the grid leak. However, once this is properly adjusted there is little need of tampering with it again. As you tune for a station slowly erase part of the pencil mark, then slowly add to it. Once the message is received it is an easy matter to tell whether the mark should be heavier or lighter by noting the effect of adding to it or erasing part of it.

Caution

In connecting your batteries to the set the first time be very careful you do not get the "B" battery and "A"

battery connections turned round, for if you do your bulbs will surely be destroyed.

A good way to avoid this danger is to connect only the "A" battery to the set as shown and leave the "B" battery disconnected. Turn all the rheostats off and plug in the phones on the last amplifier. Now when the rheostats are turned on the bulbs should burn indicating that the "A" battery is properly connected.

Then the "B" battery can be connected. But before attaching this battery see that no two wires are touching each other.

Checking Tuner Wiring

While the writer does not expect everyone who constructed this set to hear a distant station the first time he picks up the receivers, it is his desire that every builder may be able to enjoy broadcasts from his nearest broadcasting station after the few customary adjustments have been made as already described.

In the hope that each and every builder may enjoy success with his outfit a scheme will now be given by which anyone who has made a mistake in his wiring can check over his work in search of his error. The same scheme may be used in case something should happen to the wiring at any time.

In checking the wiring of the tuner a battery should be used. A dry cell such as used for a door bell will do, or wires can be connected to one cell of the six-volt battery. When one cell of the storage battery is used a current of about two volts will be obtained, which is all that should be used. Disconnect the tuner from the detector, the aerial and ground.

Now taking the lead wires from the testing battery touch one to the aerial post and scrape the other against the ground post. A spark should occur in this operation with the switch placed on

any one of the switch points. Do not leave the wires connected this way more than an instant, as this is almost a dead short and uses up the battery current very rapidly. If you see a good spark as you scrape the wire over the post that is all that is necessary. This indicates that an electrical current is established and your work so far is O. K. Should you not receive a spark you have found your trouble and you must establish good connections, soldering the taps leading from the winding if necessary. You absolutely must have good connections here.

Next try the two top posts in the right-hand end of the tuner panel. A spark should be obtained here. This indicates that the current can go into one post, thru the small coil of the vario-coupler, then thru both coils of the grid variometer and out to the other post.

Next try the two posts below these. A spark should also occur here. This indicates the current can flow thru both coils of the plate variometer.

Now try the two posts of the variable condenser. You should not get a spark here. If the faintest sign of a spark is seen here your condenser is shorted and the trouble should be located and remedied.

If the tuner passes these tests you can rest reasonably sure it is in a working condition, provided your windings are not bare in some place and touching each other.

Checking the Detector Wiring

In constructing the detector we used an extremely simplified scheme for wiring the various parts. With the detector wired as directed the filament control jacks should automatically cut out the tubes not in use and turn on the current in the ones to be used.

For the benefit of those who have been unable to get the jacks to work properly a simple diagram of the filament circuit is given in Fig. 15. In this diagram

only the circuit supplying current for lighting the tubes is shown. In tracing this circuit just simply forget that there is any circuit other than the one shown. All other connections can be examined systematically after these are known to be correct.

When the plug is placed in the detector jack the second spring of this jack is pushed away from the third spring and presses against the first spring. This

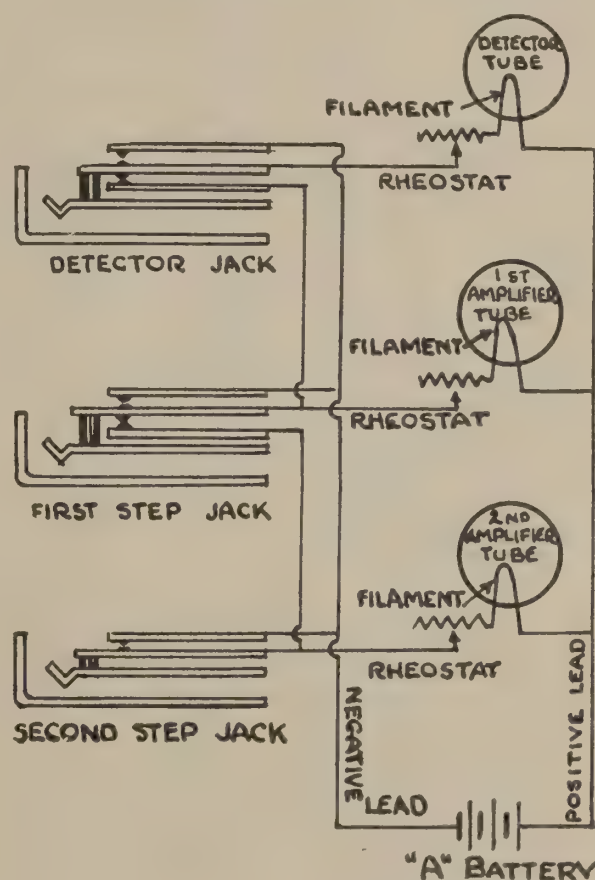


Fig. 15. Diagram for wiring the filament control jacks.

allows the current to flow from the battery thru this contact, thru the rheostat to the filament of the detector tube and back to the battery.

When the plug is placed in the first step jack the second spring is pushed away from its position against the third spring and pushed up against the first. This allows the current to flow thru two bulbs at the same time. The current going thru this contact "splits." Part of it goes thru the contact between the second and third springs of the detector

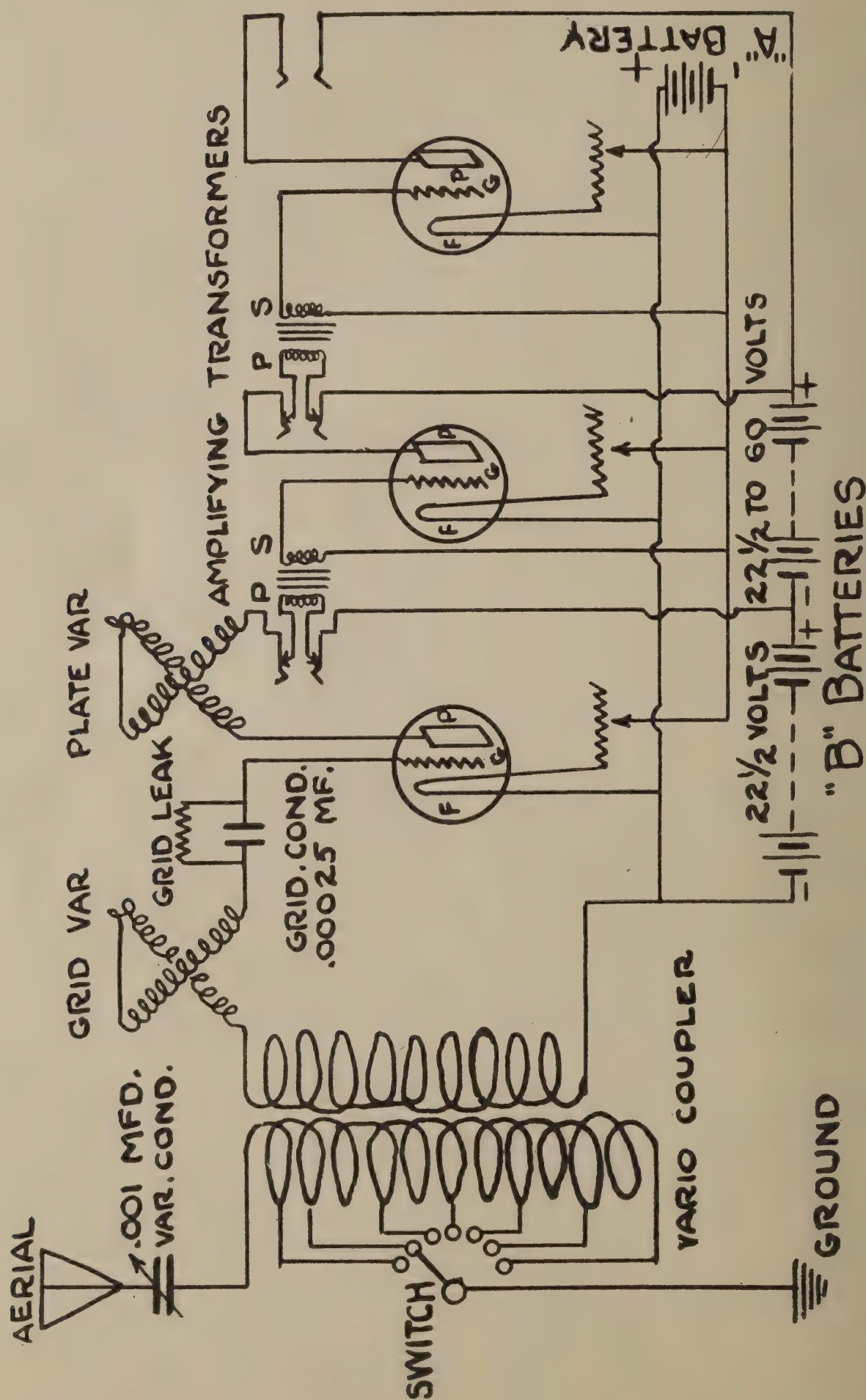


Fig. 16. Complete diagram showing how the radio set described in this article should be wired. This is one of the important drawings in connection with this article and the builder of the set should preserve it carefully, as with this he can check up his wiring.

jack and thru the detector tube. The other part goes thru the first amplifier bulb.

And when the plug is placed in the second step jack the first and second springs are forced into contact. This allows the current coming from the battery to flow in thru the first spring and out thru the second where it then splits. Part of it goes on thru the second amplifier bulb. The other part flows thru the contact between the second and third springs of the first step jack where it again divides, part going thru the first amplifier bulb and the other part going thru the contact between the second and third springs of the detector jack and thru the detector bulb.

With this information you should be able to trace any trouble in this circuit. All parts of the jacks, etc., which were not concerned in this circuit have been left out of the diagram for clearness. Where two wires cross over each other in the diagram and there is no connection between the wires a small hump has been drawn in one of the wires to show that there is no connection between the two at this point.

After all the connections in the tuner have been tested and the filament lighting circuit of the detector has been tried out the constructor can check the remainder of the wiring. As the remainder of the wiring is coupled in so many places to the circuits already tested it is best to check these connections over by a diagram which shows the complete wiring of the whole set—batteries, tuner and all. Such a diagram is shown in Fig. 16. This diagram is made as simple as possible and diagrammatically shows all the parts of the complete receiving set. After a few minutes' study of this diagram and few words of explanation the amateur should be able to easily trace over all his work in search of any possible error.

In studying the diagram you will first notice that the variometers and certain

other parts are changed around in position. This was done for clearness and to avoid having so many lines cross each other. Where one line representing a wire crosses another a slight curve or hump is drawn in one of them to show that there is no connection between the two.

As the filament control jacks have already been explained they have been left out here for clearness and the filaments appear to be connected directly to the "A" battery leads. It can be easily seen that the detector jack and first amplifier jacks are so arranged that when the phone plug is inserted into either of them the circuit thru the transformer primary is broken and the current is forced to go thru the phones. Immediately the plug is withdrawn the circuit thru the transformer primary is again established by the springs of the jack flying back into contact.

The signs and symbols used are the established ones which are shown in all articles dealing with radio, so if the reader familiarizes himself with them now he will be able to read other wiring diagrams if he has occasion to do so.

General Information

There are certain facts concerning the construction, upkeep and care of this set which either deserve special emphasis, or as yet have not been said. These things can probably best be called to the attention of the constructor by placing them together under a special heading.

The things which should receive the best of attention are, of course, the things which cost the most money. The storage or "A" battery heads this list. Were it not necessary to recharge or look after this battery a radio set would be almost as simple and easy to operate as a phonograph once it has been installed. Of course, the number of times you have to recharge this battery will depend on several things. First of all, the greater the amperage of this battery the more serv-

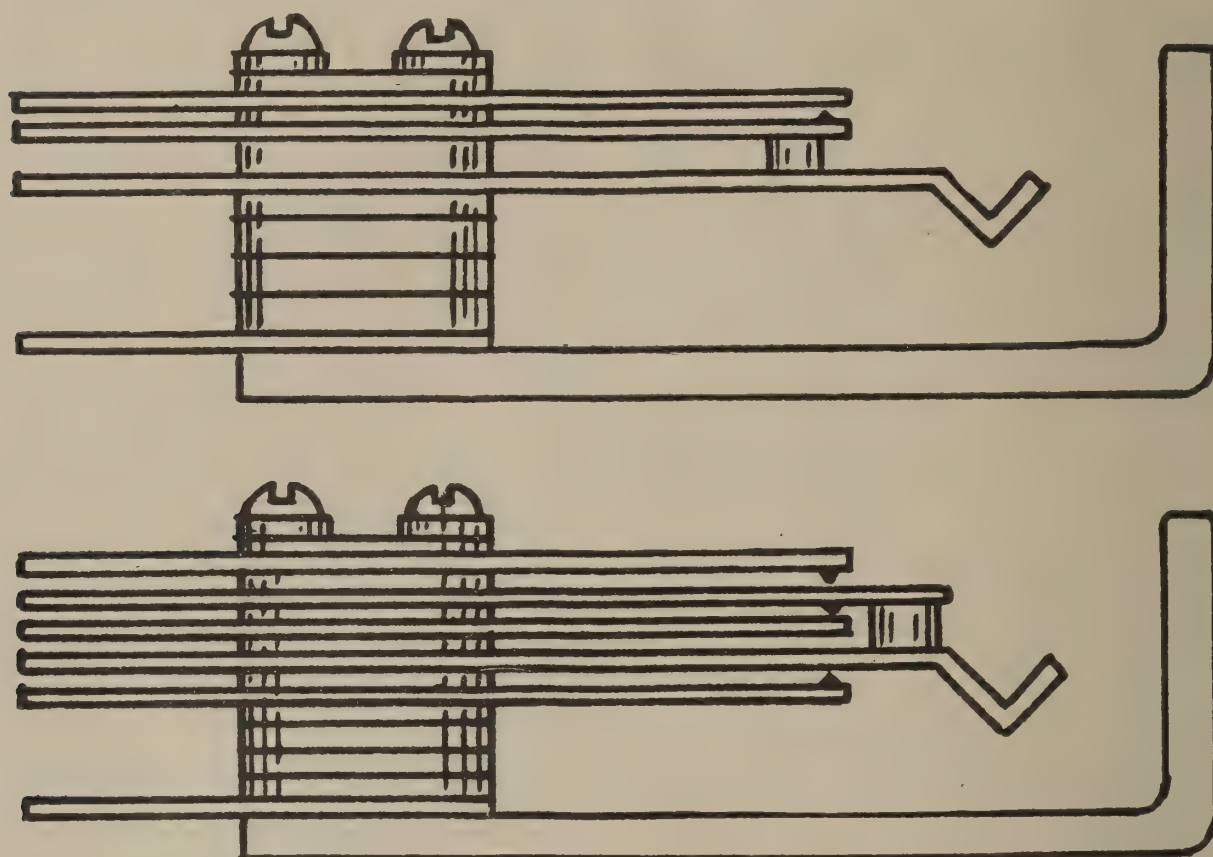


Fig. 17. Illustrating the position of the springs of the jacks when the plug is withdrawn.

ice it will give on each charge. There are fans who use only one bulb all the time and listen to the concert from their local broadcasting station nearly every evening. With such service a large storage battery will work satisfactorily for about a month on each charge. But, of course, when two or three bulbs are used all the time for long distance work the service obtained from one charge will be considerably reduced.

If desired, a small fixed condenser of .0025 Mfd. capacity can be connected between the two wires leading from the plug to the receiver cords. However, this is not necessary.

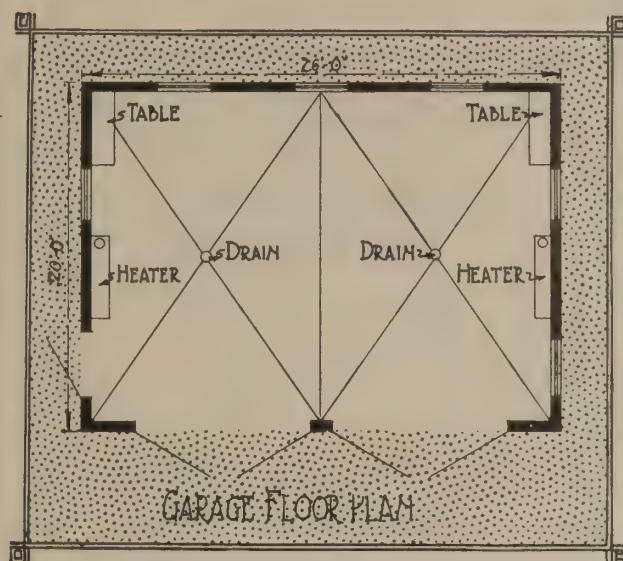
The best time—or, in fact, the only time—to test an untried set is at night when atmospheric conditions are at best. And the set should be tested at the time that the nearest large broadcasting station is known to be sending. If the sending station is very near first try one or two bulbs and if not very near try two or three bulbs. As the set is tested the grid leak can be varied.

And remember you will never receive so long as there is one poor contact in your set. In fact, most all the troubles encountered by the amateur are poor or broken contacts, and for this reason a checking diagram has been given.

Be sure the springs in the base of the tube sockets press firmly against the contacts of all the bulbs.

Certain little things have been left to the constructor's own ingenuity, such as connecting the wires leading from the rotor winding of the tuner. As you remember, these two wires were to go to the binding screws which were placed one on each side of the rotor shaft. These two wires were to be connected with play enough given to allow the rotor to turn at least half a turn. A good way to do this little stunt is to give each of the wires a turn or two around the shaft before connecting to the screw. The wires will then have the appearance of a loosely coiled spiral spring slipped onto the shaft. This little arrangement will allow plenty of play in the shaft.

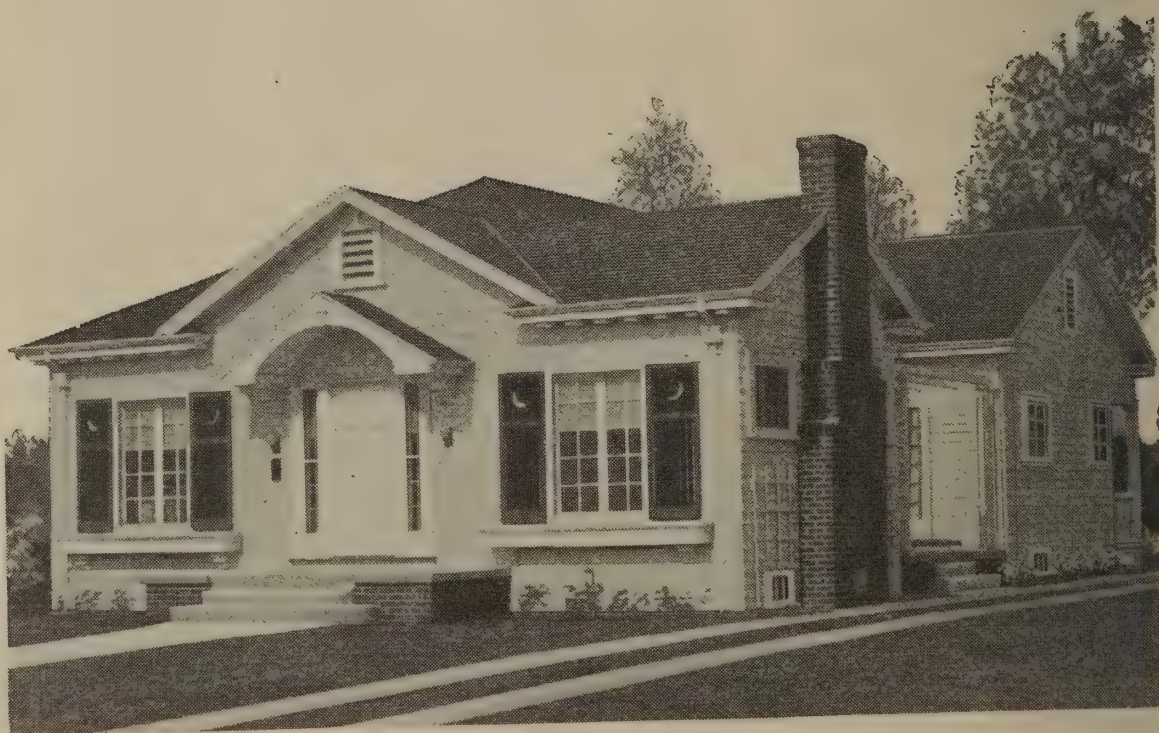
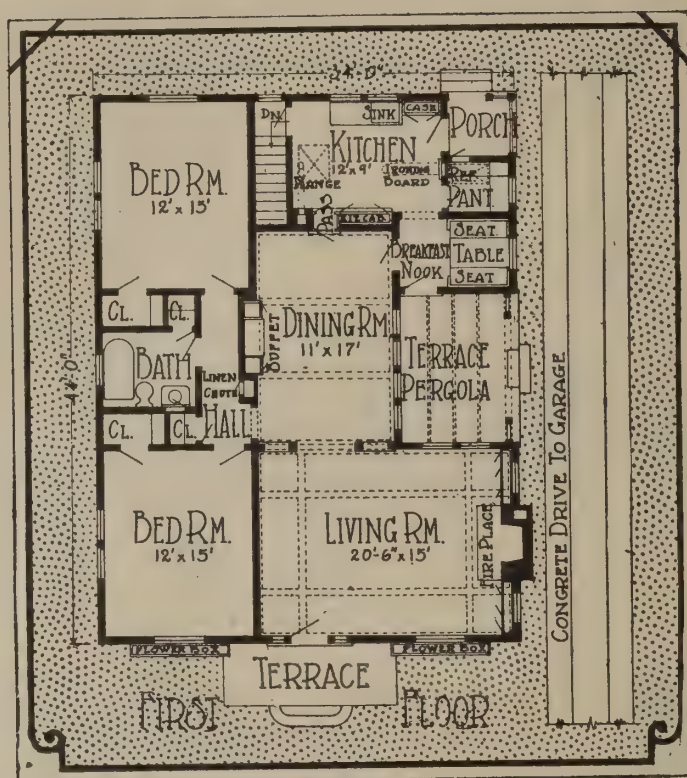
FARM MECHANICS BUILDING DESIGNS



Two-car Garage.

This handsome frame garage is 20 by 26 feet, with concrete floor and foundation. You can secure at a nominal cost complete blue printed plans and typewritten specifications of this garage or of any other building by writing the **Farm Mechanics Plan Service Bureau**, 1827 Prairie Ave., Chicago, Ill. The number of this plan is G232E. Price \$8.

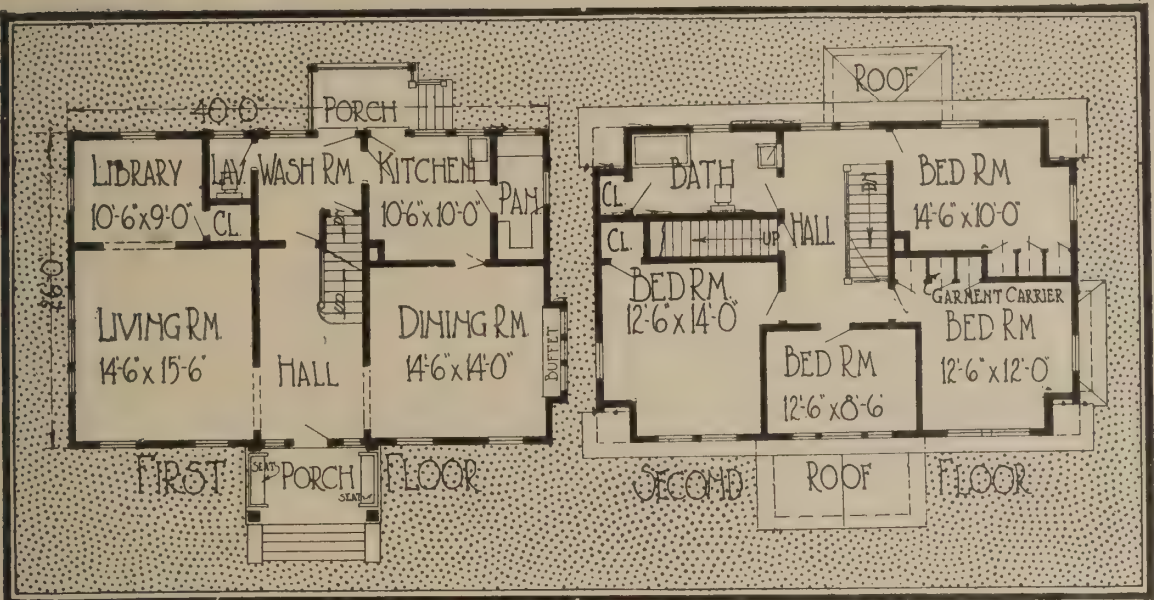
FARM MECHANICS BUILDING DESIGNS



California Bungalow.

Five good rooms and all the conveniences are included in this bungalow, 44 by 46 feet. You can secure at a nominal cost complete blue printed plans and typewritten specifications of this bungalow or of any other building by writing the **Farm Mechanics Plan Service Bureau, 1827 Prairie Ave., Chicago, Ill.** The number of this plan is 11368E. Price \$14.

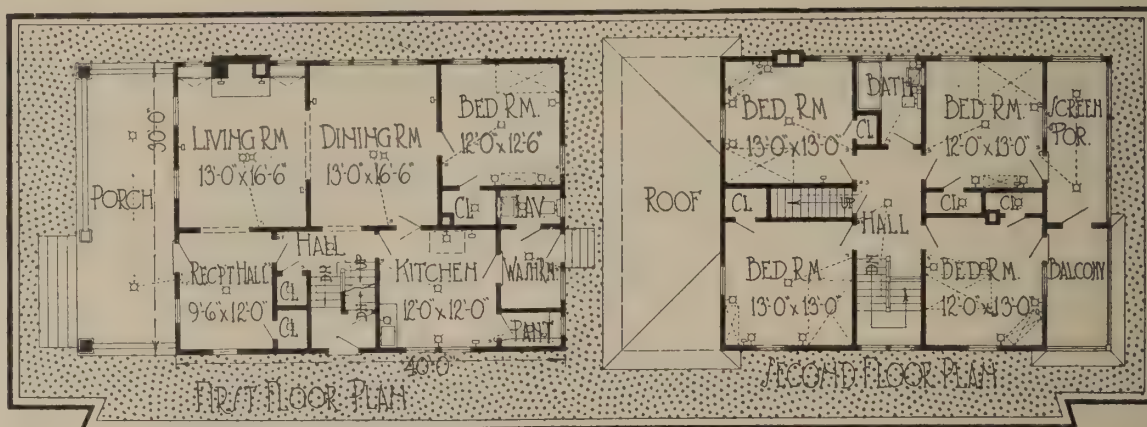
FARM MECHANICS BUILDING DESIGNS



Dutch Colonial House.

This attractive home contains eight rooms, as shown on the floor plans. It is of frame construction, set on a concrete foundation. Size 26 by 40 feet. You can secure at a nominal cost blue printed plans and typewritten specifications of this house or of any other building by writing the **Farm Mechanics Plan Service Bureau, 1827 Prairie Ave., Chicago, Ill.** The number of this plan is 10865E. Price \$16.

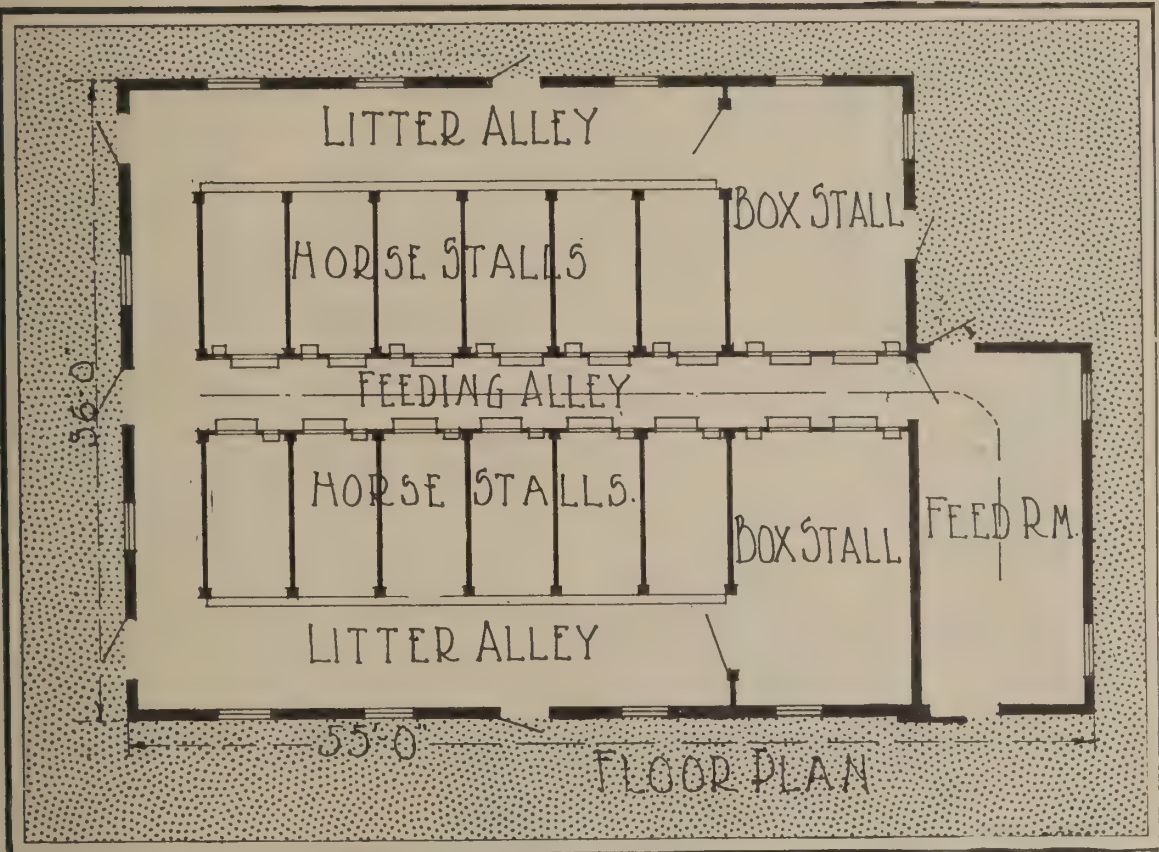
FARM MECHANICS BUILDING DESIGNS



Square Hip-Roof House.

This home contains eight good rooms, the dimensions and layout of which are shown by the floor plans. It is of frame construction, with basement, size 30 by 40 feet. You can secure at a nominal cost complete blue printed plans and typewritten specifications of this house or of any other building by writing the **Farm Mechanics Plan Service Bureau, 1827 Prairie Ave., Chicago, Ill.** The number of this plan is 10864E. Price \$16.

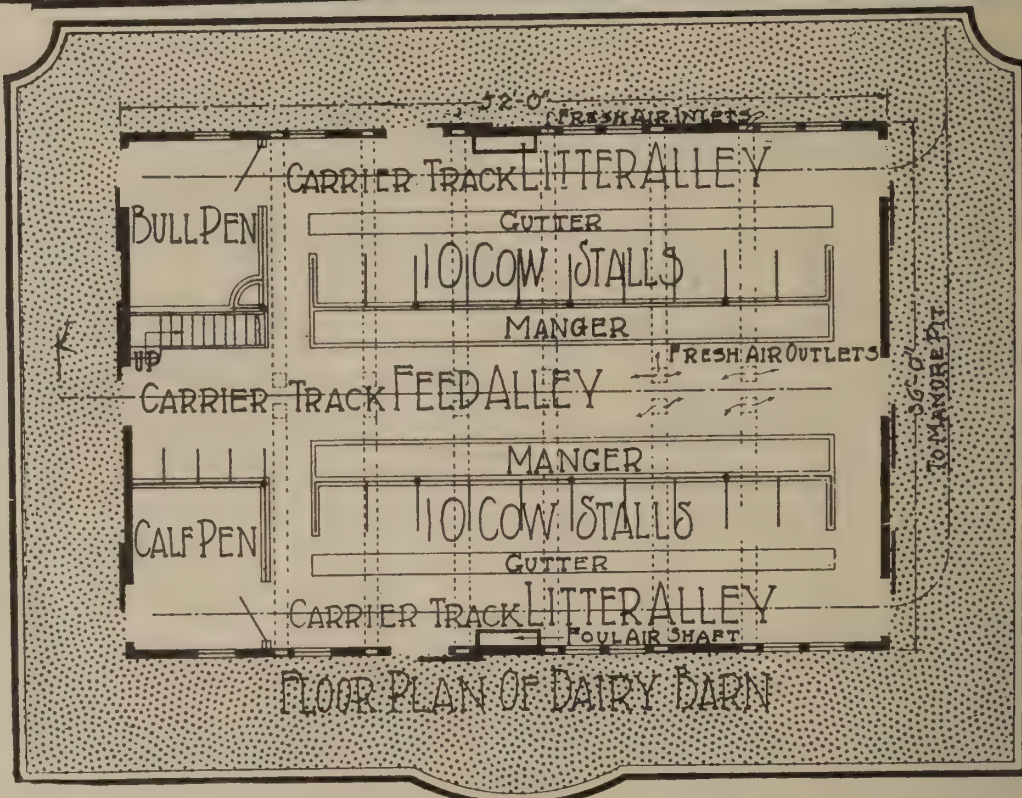
FARM MECHANICS BUILDING DESIGNS



Home for the Work Stock.

This horse barn and hay storage building is 36 feet wide and 55 feet long, and contains 12 single stalls and two box stalls. It is of frame construction. You can secure at a nominal cost complete blue printed plans and typewritten specifications of this barn or of any other building by writing the **Farm Mechanics Plan Service Bureau, 1827 Prairie Ave., Chicago, Ill.** The number of this plan is A814E. Price \$10.

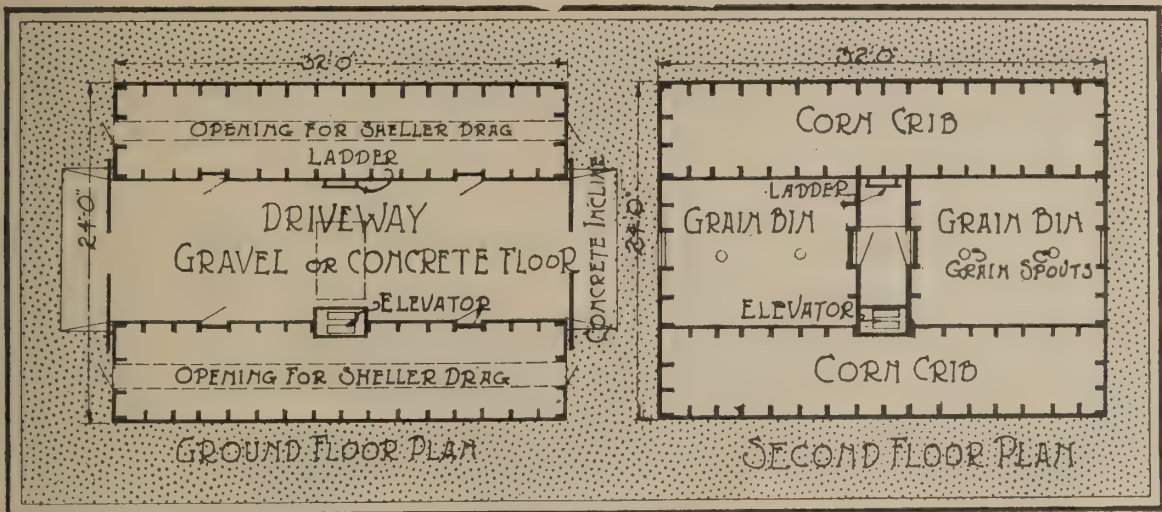
FARM MECHANICS BUILDING DESIGNS



Dairy Barn for 20 Cows.

This gambrel roof dairy barn is 36 feet wide and 52 feet long and contains room for 20 cow stalls. It is a frame building on a concrete foundation, with a concrete floor in the stable. You can secure at a nominal cost complete blue printed plans and typewritten specifications of this barn or of any other building by writing the Farm Mechanics Plan Service Bureau, 1827 Prairie Ave., Chicago, Ill. The number of this plan is A814E. Price \$10.

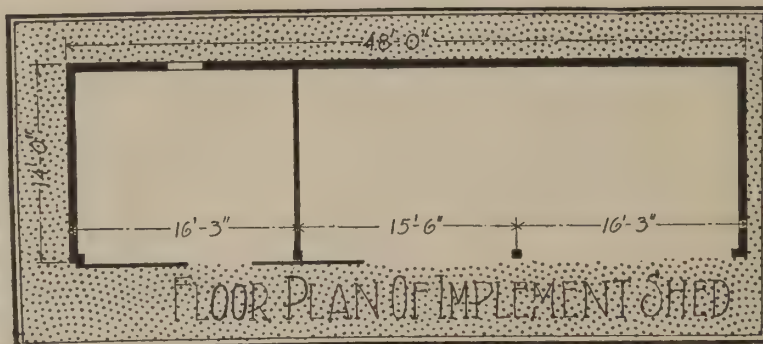
FARM MECHANICS BUILDING DESIGNS



Where the Corn Crop Is Safe.

This high corn crib and granary is 24 feet wide and 32 feet long. It is weather and rat-proof. You can secure at a nominal cost complete blue printed plans and typewritten specifications of this corn crib or of any other building by writing the **Farm Mechanics Plan Service Bureau, 1827 Prairie Ave., Chicago, Ill.** The number of this plan is A782E. Price \$10.

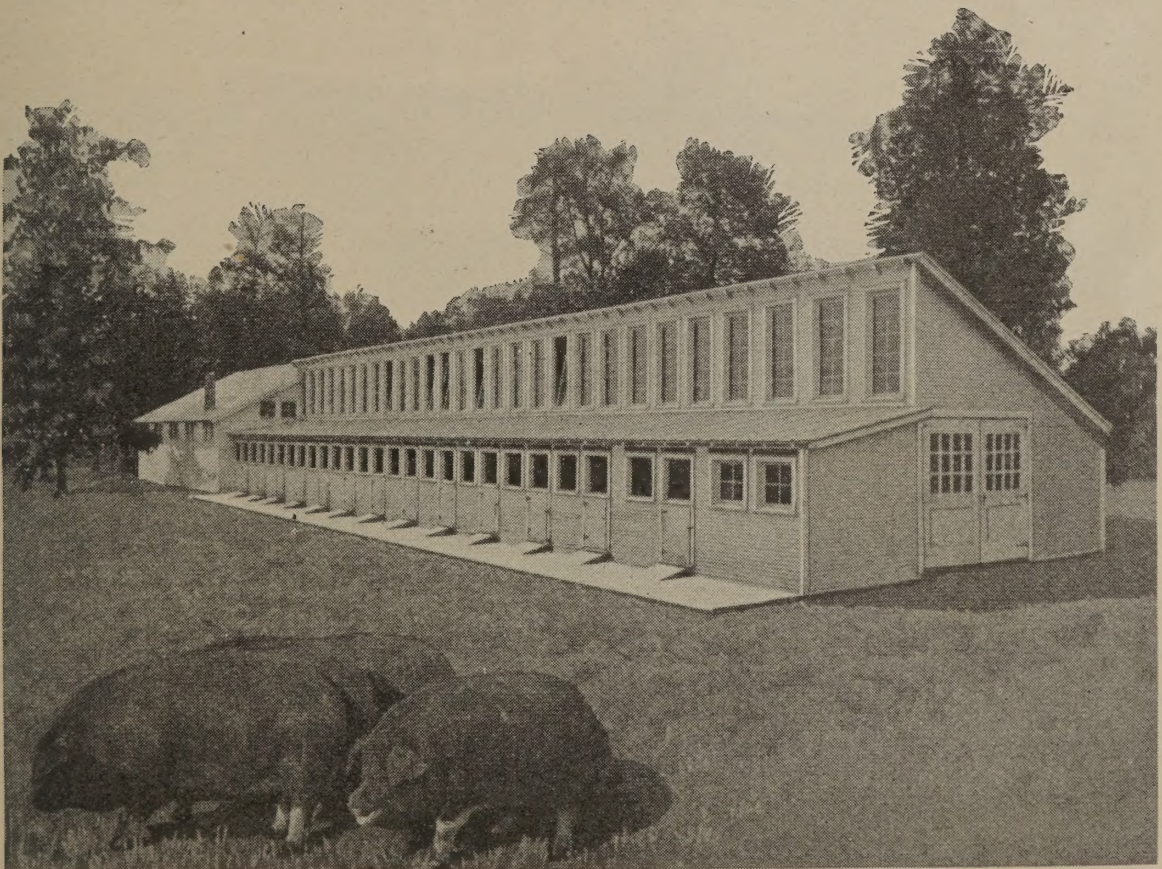
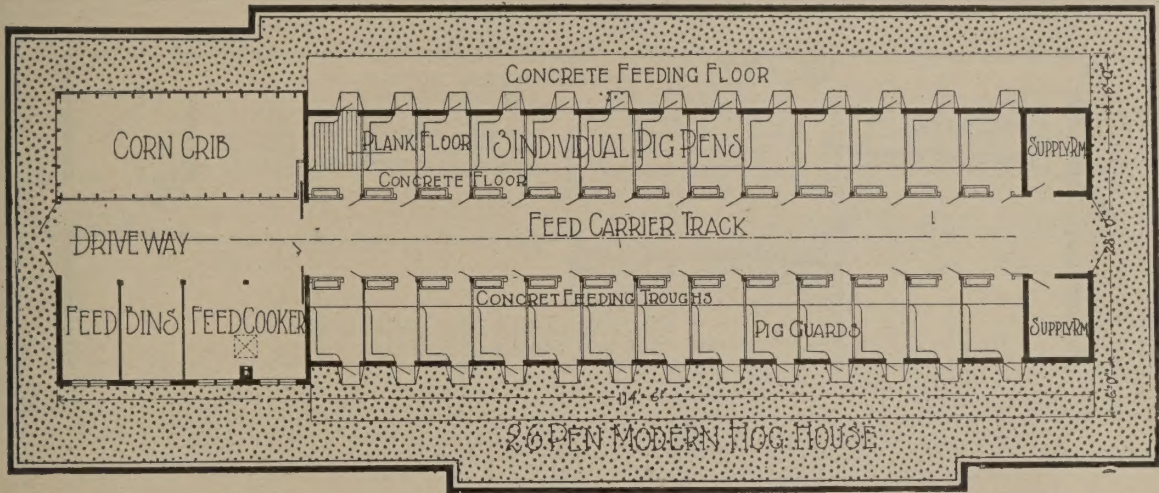
FARM MECHANICS BUILDING DESIGNS



House for the Implements.

This is a frame building, 44 feet wide and 48 feet long, one side being closed by sliding doors. You can secure at a nominal cost complete blue printed plans and typewritten specifications of this implement house or of any other building by writing the **Farm Mechanics Plan Service Bureau, 1827 Prairie Ave., Chicago, Ill.** The number of this plan is A871E. Price \$8.

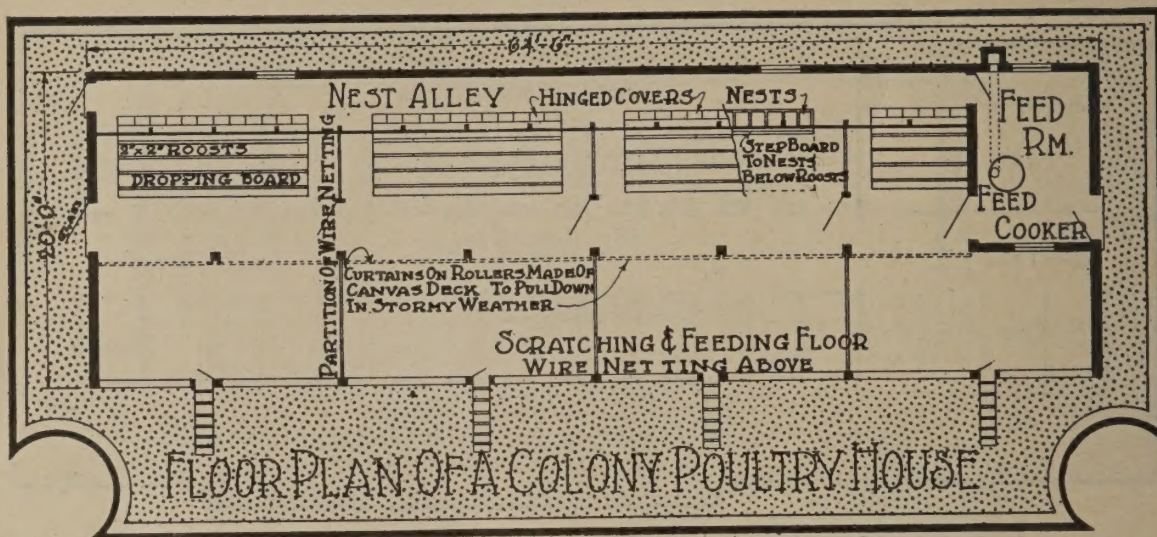
FARM MECHANICS BUILDING DESIGNS



Saw-tooth Roof Hog House.

Frame construction, set on a concrete foundation, size 28 by 114 feet. Contains 26 pens, with corn crib and feed rooms at far end. You can secure at a nominal cost complete blue printed plans and typewritten specifications of this hog house or of any other building by writing the **Farm Mechanics Plan Service Bureau, 1827 Prairie Ave., Chicago, Ill.** The number of this plan is A868E. **Price \$12.**

FARM MECHANICS BUILDING DESIGNS



A Good Colony Poultry House.

This saw-tooth, open front poultry house is of frame construction, 20 feet wide and 64 feet long. It will house 300 chickens. You can secure at a nominal cost complete blue printed plans and typewritten specifications of this poultry house or of any other building by writing the **Farm Mechanics Plan Service Bureau**, 1827 Prairie Ave., Chicago, Ill. The number of this plan is A871E. Price \$8.

A LETTER FROM HANDY ANDY

DEAR READER:—

In my book—"Handy Andy on the Farm"—I have given you many useful ideas, which I know you have and will find of great value to you. But I have many more just as good, or better, even.

Every month in "Handy Andy's Department" in **Farm Mechanics Magazine** I publish ten or a dozen of these ideas, which you will find useful. These are different than those that I have put into this book, and if you will read **Farm Mechanics Magazine** every month you will get them in addition to all the other good things there are in the magazine.

No doubt many of your friends will want to borrow my book, "Handy Andy on the Farm." When they do just tell them that I will be glad to give them a copy **FREE** if they will send me only \$1 for a year's subscription to **Farm Mechanics**. Tell them to enclose \$1 in a letter and say: "Here is \$1 for a year's subscription to **Farm Mechanics Magazine**. Please send me your book, 'Handy Andy on the Farm' without cost to me," and I will see that the book goes forward, postage paid, at once.

Remember also that I pay \$1 for ideas that you may send me and that I deem worthy of passing along to **Farm Mechanics** readers. Each idea should be described and should have either a drawing or photograph to illustrate it, as you know **Farm Mechanics** likes to have plenty of pictures, because pictures tell us the real story many times better than words.

Don't forget to tell your friends that they can have a copy of "Handy Andy on the Farm" **FREE** if they will become subscribers to **Farm Mechanics Magazine**.

Address your letters to me,

H A N D Y A N D Y,

c/o **Farm Mechanics Magazine**,
1827 **Prairie Ave.**, **Chicago, Ill.**

